

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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New Wire-Testing Machine.

The accompanying illustration represents a multiple wire tester recently constructed for the Trenton Iron and Steel Company by Messrs. Riehle Bros., of Philadelphia. It is composed of a weighing mechanism (seen on the left, with a capacity of 4000 pounds), two single or alternating pumps, a hydraulic jack, a patented three-way valve and a rising and following accumulator. The weighing end of the machine placed horizontally and secured by bolts to a foundation is accurate, and will weigh the strain on one to six wires at a time. It is provided with self-adjusting grips to take in wires from No. 10 to No. 16, and hold them firmly. It can be adapted to take in a larger or smaller range of numbers when desired. There is a set of gripping appliances at both ends, and in the present instance they are 90 feet apart—one set at the scale end, and the other secured to head of piston. The jack is 5 feet in length, and lined with brass; its outside diameter is $3\frac{1}{2}$ inches; its inside diameter, $2\frac{1}{4}$ inches. Like the scale end, it is firmly bolted down to its foundations. The plunger has a stroke of 4 feet. It is supported and guided by three guides, the top one being a straight tube running on turned rollers. A three-way valve controls the movements of the jack and accumulator, and supplies water to the jack by a lever. When the lever is raised the water is forced into the larger area of the jack, causing the plunger to move backward and bring a strain on to the wires or other specimens; when the lever is lowered

1. *Historical.*—The use of steel for shipbuilding was first tried in England about the year 1860. According to a paper read by Mr. Ravenhill, on April 6, 1881, before the Institute of Naval Architects, the Jason, a ship of 450 tons, was built by Samuda Bros. in 1859, for the North Sea trade. In 1860 and 1861 five packet boats were built for the London, Chatham and Dover Railway—the Samphire, Maid of Kent, Scud, Foam and Petrel—all of which, however, were of very small tonnage. The first use of steel by the Admiralty was in 1863, in the building of the Bellerophon.

The general use of steel, however, in England is only a few years old, as will be seen from the following table of steamers and sailing vessels built of that metal:

Year	No.	Tonnage	No.	Tonnage
1878	5	2,929	0	0
1879	6	12,478	1	1,700
1880	17	27,515	1	1,945
Building on 31st December, 1880	84	111,467	2	1,700

In 1882, according to Mr. Wm. Parker, chief engineer of Lloyd's, there were at least 73 large steamers built of steel. In January, 1883, 116 steamers were in course of construction. (*Vide Journal of Iron and Steel Institute*, 9th May, 1883.) The want of success attending the early introduction of steel was solely attributable to the use of a metal too hard and brittle. Soft steel was not known. It may be said that steel shipbuilding in England had two beginnings—first, in 1860, when the unsuitability of avail-

engaged in the manufacture, especially of steel plate, for the boilers of Transatlantic steamers. In 1870 specimens were submitted to the late Sir W. Fairbairn, who said that for ductility and elasticity he knew of nothing to equal it. Messrs. Schneider, of Creuzot, also took up the business, and in 1873 they, as well as the Terre Noire Works, supplied soft steel for ironclads. Since 1874 all French ironclads have been steel-built, and the amount of steel plate produced in France during the five years ending 1882 is as follows:

Year	Tons	Year	Tons
1878	10,300	1881	18,400
1879	14,900	1882	21,300
1880	18,500		

In the 13 years ending 1882 the works at Creuzot have furnished 13,600 tons of steel plates for ironclads and other uses connected with the French marine; also 5350 tons bar steel for the same purposes. For foreign navies and for private shipbuilders they have made 14,000 tons plates and 10,900 tons bar steel.

The other French steel works supplying materials for the navy are: La Compagnie de la Marine et des Chemins de Fer à Saint Chamond, La Compagnie d'Acieries de Saint Etienne, La Compagnie de Chatillon-Commentry, La Société de Denain, La Société de Saint Nazaire.

2. *Quality of Metal.*—The quality of metal suitable for naval construction is set out in a pamphlet dated 11th May, 1876, issued by order of the French Ministry. The qualities

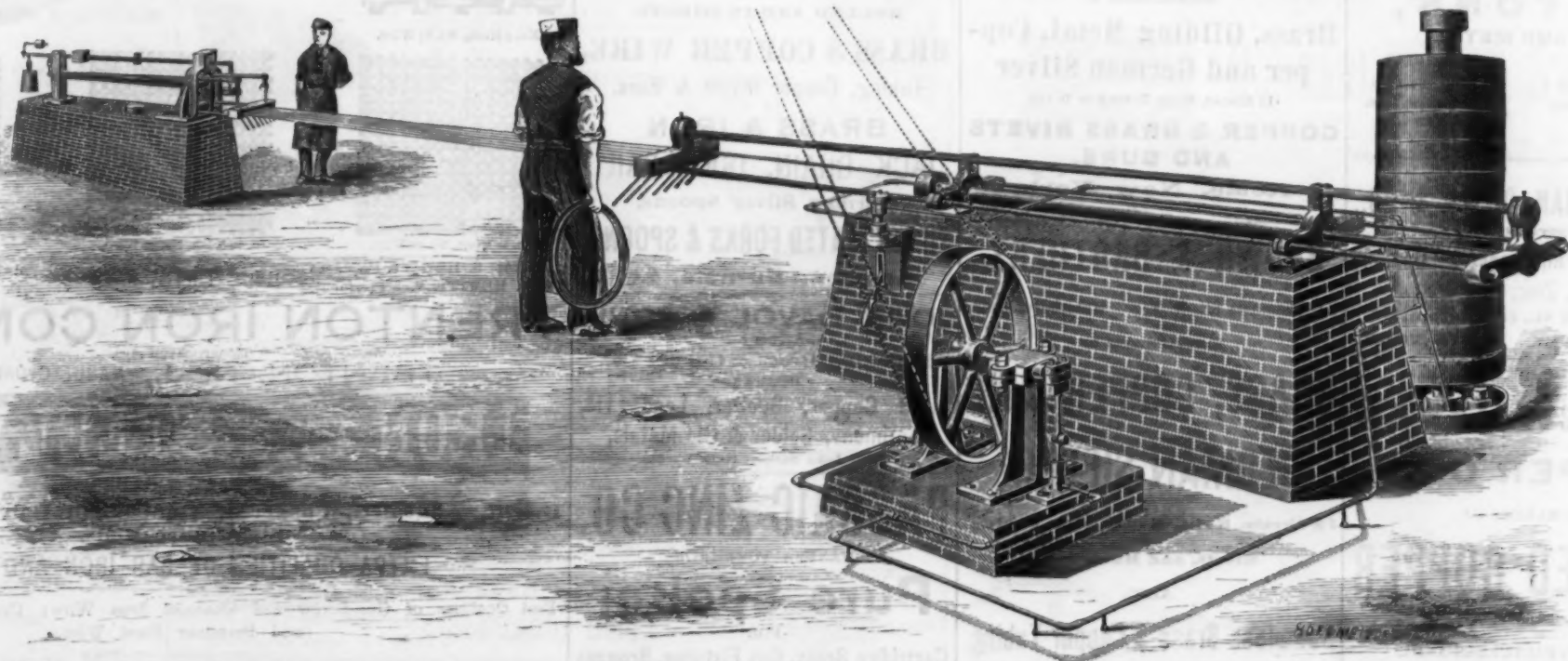
in its own plane, the other forming a cylinder having an internal diameter $3\frac{1}{2}$ times the width of the table. Another piece, cut from another bar, is opened so that the two interior surfaces are in the same plane. Lastly, a third piece is closed, so that the two sides meet. These pieces should show no flaws nor cracks. For double T-bars a piece is cut along the web, a hole pierced at the end, and one side is bent at an angle of 45° to the other.

(c) The tempering tests are similar to those for plate steel, with the exception that the radius of curvature should not exceed $1\frac{1}{2}$ times the thickness.

One important point is that for several years past all the steel works have furnished steel of a constant quality and perfect homogeneity, whether made by the Bessemer or the Siemens processes. The latter is usually the easier and more successful. The French marine has, since the commencement of the year 1883, inclined rather to the use of softer steel for hulls. The figures specified in December, 1882, and January, 1883, for ships now building, are as under: *Plate Steel.*—Resistance, 40 kg. ($24\frac{1}{2}$ tons); elongation, 24 per cent. across. *Bars.*—Resistance, 38 kg. ($23\frac{1}{2}$ tons); elongation, 26 per cent. lengthways. This reduction is somewhat puzzling, especially as the steel lately furnished, with the old figure for breaking load, has generally given an elongation very nearly equal to that now proposed. It is obvious that by reducing the limit of strength we so far throw away the advantage of steel as compared with iron. To elucidate the point, the

duction of strength were extended to the plates and bars used in the other parts of the hull and not exposed to the same deterioration. In this respect the tests which have hitherto been found satisfactory should be maintained. Such are the views of M. Berrier Fontaine. With these the author agrees, and considers that the best steel for hulls of vessels would be that having about 28 tons per square inch resistance and 22 per cent. elongation with a test-piece 8 inches long.

Before passing on, the writer makes a few remarks on the question of elongation, especially as influenced by the dimensions of the test-piece. He observes that when a metal bar of any kind is subjected to increasing loads there is first an elastic elongation proportional to the load, which is at once very small in amount and nearly the same for all kinds of steel. Then follows a permanent set, which rapidly becomes marked and then localizes itself at one point. At this place the bar draws to a very reduced section and finally breaks. Hence the ultimate elongation is composed of two parts, one of them proportional to the length of the test-piece, and the other (which has been called the breaking elongation) being produced only at one point, and being the same whatever the length of the test-piece may be. The result is that if we take two test-pieces of exactly the same metal and of different lengths, say 8 inches and 4 inches, we shall find that the elongation after rupture will be very different. The results of nearly 1000 tests bearing on this subject are



NEW WIRE-TESTING MACHINE, BUILT BY MESSRS. RIEHLE BROS., PHILADELPHIA, PA.

the water in the larger area of jack only returns to the reservoir of the pump (to be used again). Now, without changing the position of the lever, the plunger will return automatically, without weight or counter-balance, with a steady, smooth and uniform motion. The pump has a slow motion, 60 revolutions per minute. It has two single-action pistons, and the valves are so simple and readily accessible that an ordinary mechanic can examine and repair, when necessary, in a short time. The accumulator is so arranged as to overflow when it comes to its maximum height. The machine can be adapted for several uses, but is principally applied to stretching and straightening wires in lengths to a given amount. The weight on the scale and that on the accumulator is made to correspond, so that wires of a certain number or size can be quickly tested in quantities under exactly the same conditions, with only the movement of the lever.

The Substitution of Steel for Iron.

The following is a translation that appeared in the *Iron and Coal Trades Review* of a paper by M. S. Perissé, which was read and discussed at length at a recent meeting of the French Society of Civil Engineers: After a brief general introduction M. Perissé stated that it was not his intention to speak of the methods of manufacturing steel, but only of the uses to which it may be advantageously put, and especially the following:

- I. Shipbuilding.
- II. Ordinary buildings of a civil nature.
- III. Parts of machinery.
- IV. Steam boilers.

Rails, guns and other uses for which the advantage of steel was fully recognized, he would leave on one side.

1.—SHIPBUILDING.

The section on shipbuilding he subdivided into the following four heads: 1. Historical account of the use of steel. 2. Quality of the metal. 3. Method of working and applying. 4. Advantages of steel hulls.

able material produced bad effects; and again, in 1875, when English builders, seeing the vast advantages reaped by the French from the use of steel, began to adopt it largely, for in France, as even the English admit, the new metal was largely used and rapidly improved upon. In 1875 the chief constructor, Mr. Barnaby, read a paper before the Institution of Naval Architects, on "Iron and Steel in Shipbuilding." In this he referred to a visit he had paid to L'Orient and to Brest in 1874, where he had witnessed the construction of steel vessels in the dockyards of the French marine. He said that the materials not only seemed excellent, but that the French were advancing in the use of steel much more rapidly than the English. He described the great French ironclad, the Redoutable, then building at L'Orient, and the extensive use made of steel in her, as also in the *Tonnerre* and *Tempête*. He stated that in October, 1874, 600 tons of Bessemer or Siemens plates had been already used in the construction of these three ships, and about 12,000 m. of steel rollings had been already put in place.

It was owing to the suggestion of M. de Bussy, chief constructor, in April, 1872, that the French Government resolved to try the use of steel in the construction of the Redoutable, of 3800 tons, a most important vessel to make a new experiment upon; but the new metal was not entirely unknown, owing to the fact that in 1870 the factory of Terre Noire, which had contracted to deliver at L'Orient 80 tons of plates and angles of superior iron, had fulfilled their contract by supplying the sheet and angle iron in Bessemer soft steel, which they were then making largely. A discussion at once arose: the materials were refused, the dockyard stating that they would not employ them at any price; that they had bought iron and did not want steel; but at the instance of M. de Bussy, the goods were finally accepted and made use of for the purposes intended.

The factory of Terre Noire had been experimenting for some time in the new metal, having arranged with Mr. Henderson, in 1865, for the manufacture of alloys rich in manganese, an essential element of soft steel, and in 1868 and 1869 were actively

of plate steel and of angle and bar steel are different. Plate steel undergoes three tests: (a) Cold test. (b) Hot test. (c) Tempering test. (a) Cold tests determine the resistance and elasticity of the metal. The sample is of rectangular section, 30 mm. broad (about $1\frac{1}{4}$ inches), as thick as the plate, and 200 mm. long (8 inches). The breaking load, per square mm., and the elasticity, ought to show the following results, a load equal to four-fifths the breaking load having been previously applied for five minutes: For plate steel for hulls, from 6 to 20 mm. thick, in the direction of least resistance.—Load, 45 kg. per square mm. (28 tons per square inch); elongation 20 per cent. For straps and cover plates 6 to 16 mm. thick.—Load lengthways, 48 kg. (29.75 tons); load crossways, 44 kg. (27.25 tons); elongation lengthways 20 per cent., elongation crossways, 18 per cent.

(b) Hot tests consist in working a piece of the steel into a hemispherical cup, with a flat rim in the original plane of the plate. The diameter of the hemisphere is 40 times the thickness of the plate, and the rim is 10 times the thickness in width. In addition, for sheets more than 5 mm. thick a flat-bottomed vessel is made, the rims being square. The size of this vessel is 30 times the thickness and the rim 10 times the thickness. These pieces, where carefully worked, should show no cracks nor flaws.

(c) Tests by tempering are made with pieces 26 cm. long and 4 cm. wide (10.4 inches and 1.6 inches) cut both along and across the plate. Heated to redness and plunged in water at 28°C ., they should take under pressure, without heating, a permanent curvature of which the radius should not be greater than the thickness of the bar.

Rolled bars also undergo three tests: (a) The cold test is made with a piece of the same size as the plate test-piece, but taken only along the grain. The limits are as follow: For angle and T iron.—Load, 48 kg. (29.75 tons); elongation, 22 per cent. For double T or I iron.—Weight, 46 kg. (28.5 tons); elasticity, 18 per cent.

(b) In the hot tests for angle irons a piece is worked so that one of the tables remains

tests for the latter must be touched upon. The French marine recognizes four qualities of iron: 1, common; 2, ordinary; 3, superior; 4, fine. Of these 2 and 3 are the qualities generally in use, and No. 2 is that employed for the hulls of ships. In this quality the test of plates for shipbuilding are a resistance of 31 kg. (19.2 tons), and an elongation of 5 per cent.; for bars a resistance of 34 kg. (21 tons), and an elongation of 9 per cent. Hence M. Perissé considered an elasticity of 20 or 22 per cent. quite enough for steel, and he is supported by M. Berrier Fontaine, the well-known naval engineer of Toulon, in this view. The latter considers the steel now used to be so sound and homogeneous that no special precautions are needed to guard against sudden fracture, and he points out that the quality required in France is even now higher than in England. The English Admiralty tests are: Resistance, 41 kg. (26 tons to the square inch); elongation (minimum), 20 per cent. Lloyd's Registry require—resistance, 42 kg. (27 tons to the square inch); elongation, 20 per cent. The Liverpool Society of Underwriters require—resistance, 44 kg. (28 tons per square inch). The general idea among English engineers (at the time of the paper read on the subject by Mr. H. H. West) was that this resistance should be increased to 30 tons.

The only point on which any doubt remains is as to plates actually belonging to the skin of the vessel; and this from the prevalent idea that the harder the steel the more rapidly it is attacked by salt water. This idea, however, M. Fontaine did not consider to have been fully established by experience. It would be well to make a series of experiments on different steel plates, in order to make sure whether they are less attacked by salt water as their quality is softer. Should this prove to be the case, it would be well to specify only the very mildest steel—say of 25 tons per square inch—for the skin of vessels. This would still be better than to go on making them in iron, the strength of which can only be considered equal to about 20 tons per square inch when taken across the grain. At the same time, it would be very unfortunate if the same re-

given in the following table, in which the fact just mentioned is very clearly shown:

Nature of steel (not annealed).	Br's load. Tons per sq. in.	Mean elongation. In 8 in. Per cent.	In 4 in. Per cent.
Slightly hard.....	37.0	14	17 to 18
Average.....	31.0	16	20
Slightly soft.....	31.0	19	24
Soft.....	26 to 28	22 to 23	30

The mode of manufacture and chemical composition of the steel has a great influence on the elongation. Again, annealing augments the softness, and therefore the elongation, of the metal, while it diminishes its breaking load. The limit of elasticity in steel, especially when annealed, is approximately half the breaking load. For unannealed steel the ratio is somewhat higher, and for soft steel hardened it is considerably lower, but this hardening has the effect of increasing the breaking load. The knowledge of this limit of elasticity is a very important point, not sufficiently considered, for it is to this rather than to the breaking load that the factors of safety should be referred. Hence, testing machines should be provided with some indicator gear, allowing the machine itself to trace a curve of elongation as the loads are increased. The limit of elasticity will be easily recognized, and the labor of the experimenter will be much reduced. The mode of preparing the test-piece has also some influence on the results. The more work that has been put upon it in the preparation the less will be the contraction at fracture. Thus, for instance, the test piece ought never to be forged. It is a question whether in view of the violent blows to which vessels are exposed some impact test should not be required. This is not at present the case, however, in the French navy.

3. *Methods of Working.*—In working steel hot all work should cease when the metal cools to a dark red, and it should be reheated to high red before recommencing. This is because at such a heat (300° to 400°C .) steel is brittle, and much more so than iron. The whole mass worked should be of uniform temperature. It should cool in the air, and should rest on a homogeneous surface, so as

(Continued on page 5.)

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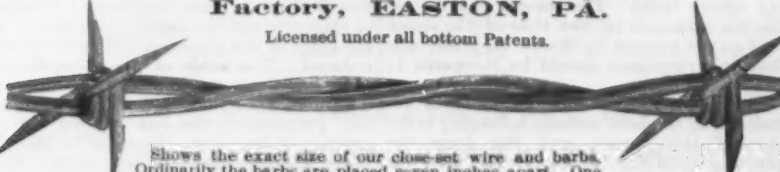
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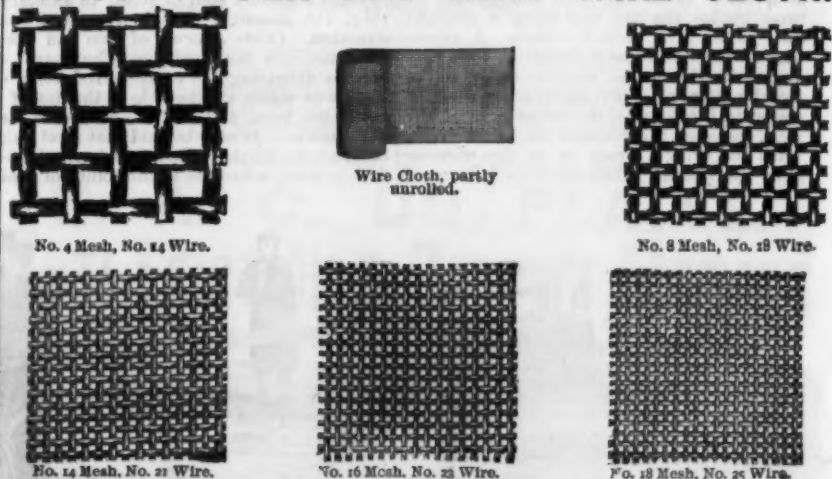
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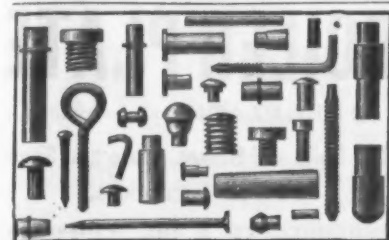
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CHARCOAL PIG IRON.
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(Continued from page 1.)

to cool uniformly. Heavy wooden mallets
are used for flattening, and copper mallets,
too, are advantageous in heavy and difficult
work. The hydraulic press is used with
great effect instead of hammers. If cold
forging is unavoidable, the plate should be
struck on as large a surface as possible, and
worked at several operations. Plates should
be cut with straight shears, angle iron with
cold saws; punching should never be used
for this purpose. In general the tools which
do their work in the cleanest and neatest
manner are also those which deteriorate
least the parts of the metal surrounding what
is operated on. For this reason it is always
desirable, where possible, to substitute machine-work for hand-work, and also to see
that the cutting edges of all tools are kept in
perfect order.

For some time drilling has been preferred
to punching both in England and France, on
account of the damage which the latter was
found to cause to the tenacity of the steel.
This damage, however, only extends over a
zone about 1/8 inch thick, surrounding the
hole punched, and it may be effaced by
cutting out this hard zone with a rimer or
otherwise. The damage will be less if the
die is made decidedly larger than the punch,
so as to make the hole somewhat conical.
It may also be effaced by annealing, and
probably in the future it will become the
practice to finish off every piece on which
much work of any kind has been bestowed
by careful annealing, so as to insure that it
shall be brought into the softest and most
homogeneous condition of which it admits.
As to riveting, steel rivets are now used in-
stead of iron to a large extent. Mr. Barnaby,
having experimented largely with them,
found that iron rivets are not satisfactory in
joining steel plates.

Advantages of Steel Hulls.—These are
summed up as follows:

1. A steel hull may be 15 to 20 per cent.
lighter than an iron one.
2. Steel hulls are, on the whole, cheaper
than iron.
3. Steel plates are at present as cheap as
iron, taking account of quality.
4. The lightness admits of heavier lading,
either in armament for ships of war or
freight for merchant ships. Thus, taking
the steel displacement at 100, it will be made
up as follows in the two cases:

Iron.	Steel.
Hull..... 40	Hull..... 34
Engines, fuel, &c..... 30	Engines, fuel, &c..... 20
Freight..... 40	Freight..... 46
Total..... 100	Total..... 100

Thus steel boats admits of more freight, more
powerful engines, more coal, and consequently
greater speed.

5. Superiority in case of running ashore.
Being more elastic, steel ships suffer less
from collision or stranding. For example,
the *Devastation* ran aground 12th Novem-
ber, 1881. She was about 10,000 tons, and
steel-built. On the 17th she got off and re-
turned to L'Orient. She showed no signs of
damage in the interim. A somewhat similar
accident occurred to the British ship *Agincourt*,
which, being an iron ship, suffered
very considerably. M. Perissé, in concluding
this portion of his paper, stated that all
experience went to show the great superiority
of steel over iron for all shipbuilding
purposes.

(To be continued.)

The Debts of Nations.

At the Montreal meeting of the British
Association, Michael G. Mulhall, F.R.S.,
read a paper on national debts, which con-
tained a vast amount of valuable information.
In tracing the growth of debt Mr. Mulhall
starts from the Treaty of Utrecht, in 1713,
when public debts were in their infancy.
He shows that the debt of Great Britain rose
from £54,000,000 in 1713 to £756,000,000 in
1884; France from £48,000,000 to £995,000,
000 in the same period. Russia had no public
debt—at least there is no record—until
somewhere about 1793, when it amounted to
£30,000,000, and reached £555,000,000 in
1884. Austria's has risen from £10,000,000
in 1713 to £508,000,000 in 1884. The United
States debt in 1793 was £10,000,000; in 1884
it amounts to £305,000,000. Canada, which
owed £17,000,000 in 1870, now owes £38,
000,000. Australia's debt has risen from
£37,000,000 in 1870 to £116,000,000 in 1884.
All Europe owed in 1713 the modest sum
of £119,000,000; to-day its public debt amounts
to £4,414,000,000, or in round numbers
£22,070,000,000. "The world"—by which
is meant the European countries and the
United States, Spanish America, Canada,
Australia, India, Japan, Egypt and South
Africa—has to-day the respectable public
debt of £5,431,000,000, or \$27,155,000,000.

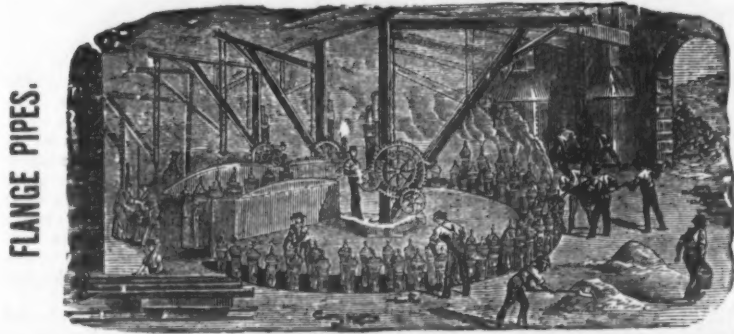
In showing what became of the money,
Mr. Mulhall traces the various wars in
which the civilized nations of the earth have
been engaged during the century, coming
down to the year 1834, of which he remarks:
"The year 1834 marks a new epoch in the
economy of nations; the political convulsions
all over Europe, the introduction of
railways, the discovery of new gold fields,
the birth of free trade; moreover, the aboli-
tion of serfs in various countries, the inven-
tion of electric telegraphs, the outflow of
emigrants to America and the British colonies,
the spread of popular education and
cheap newspapers—all these circumstances,
occurring almost simultaneously, gave a
great impetus to human industry and enter-
prise." From 1848 to 1884 he divides the
increase of debt between employment in
peace and war as follows:

PEACE.	WAR.
Russian serfs.....	£280,000,000
Lighthouses and harbors.....	38,000,000
Roads and bridges.....	720,000,000
Railways and telegraphs.....	870,000,000
British colonies.....	288,000,000
Sundries.....	104,000,000
Total.....	£2,105,000,000
Crimean.....	£305,000,000
United States.....	474,000,000
France-German.....	882,000,000
Russo-Turkish.....	211,000,000
Ironclad ships.....	138,000,000
Sundries.....	375,000,000
Total.....	£1,875,000,000

These make up a sum total of £3,978,000,-
000, but of this sum £200,000,000 have been
redeemed. Dividing the time since 1713

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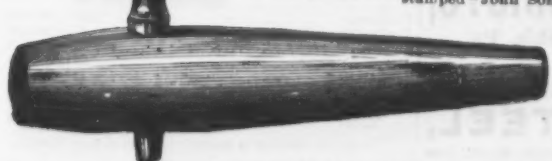
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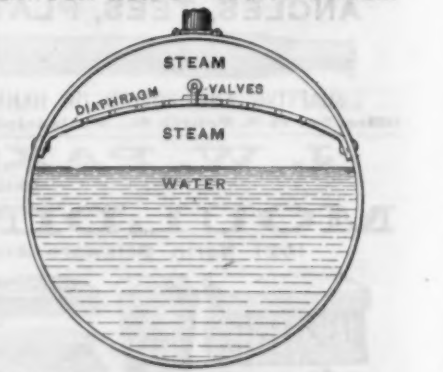


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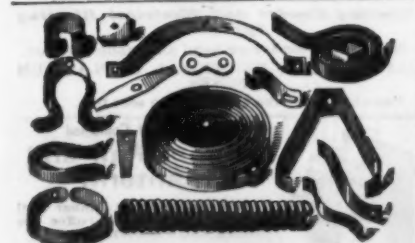
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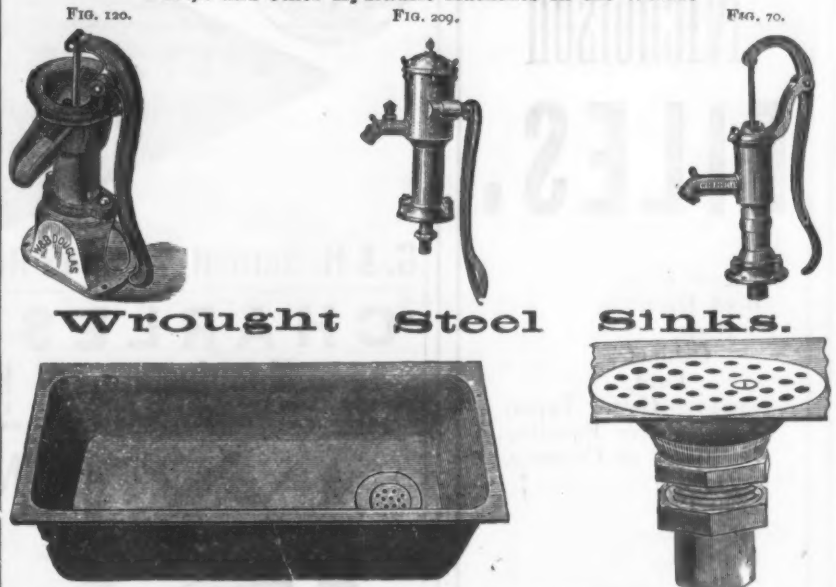
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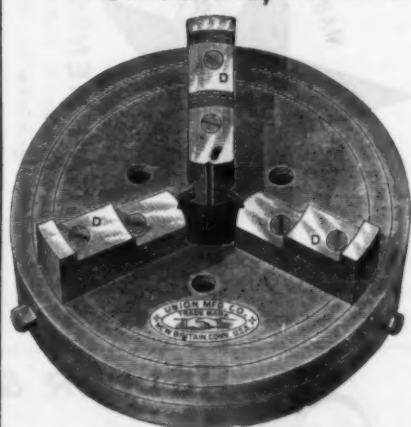


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into four periods, Mr. Mulhall makes the following comparison between employment in peace and war, from which it will be seen that 60 per cent. of the existing debts stand for war expenditure and 40 per cent. for reproductive work, the amounts given being millions of pounds:

	Peace.	War.	Total.
Before 1713.....	119	119	1,318
1713-1815.....	1,318	1,318	212
1815-1848.....	162	50	1,672
1848-1884.....	2,105	1,672	3,782
Total	2,387	3,164	5,431

As to the effects of public debt, Mr. Mulhall finds that "the growth of debt in Europe since 1713 has been accompanied by an enormous increase of wealth, a marvelous improvement in the condition of the working classes, and a better system of government, local as well as general, than was known before." He admits, however, that many of these improvements would have taken place had there been no debt, but he thinks it is well to keep the facts in view. The debts of Europe to-day represent only 11 per cent. of the public fortune, whereas Great Britain in 1817 had a debt equal to 35 per cent. of her wealth. Mr. Mulhall holds that the capitalists, not the peasant class, bear the weight of taxation. He says that "if the national debt of Great Britain were abolished the condition of the peasant class would not be sensibly affected or improved," and he points out that the condition, food and wages of the peasantry of Europe have so improved in the last 50 years that the change in so short an interval would appear incredible. During the period in which the public debt of the Continent increased most rapidly—say, from 1870 to 1882—the deposits in savings banks there rose from £151,000,000 to £318,000,000.

In treating of the burden of the debt, although the ratio of the debt to accumulated wealth is greater to-day than it was in 1848, Mr. Mulhall claims that it really bears less heavily than at that time on those interested. In treating of the British national debt, which seems so enormous, Mr. Mulhall maintains that, "so far from our national debt being a heavy burden on the nation, it is less than five years' savings, for we find that the accumulations of wealth between 1870 and 1880 averaged £154,000,000 per annum. And if we compare the annual charge for service of the debts with the national earnings, we find that the earnings of eight days cover the former, which is less than in most countries. * * * The burden of annual charge for the Continent of Europe is £141,000,000, which is equal to 12 days' earnings, against eight in the United Kingdom; therefore the debts of the Continent are relatively 51 per cent. heavier than in Great Britain. On the other hand, the United States require only three days' earnings for service of their debts, whereas in Australia the relative burden is double what it is in Great Britain."

Mr. Mulhall deduces the following conclusions from the facts he has presented:

1. That national debts are not to be viewed with such horror as our grandfathers and grandmothers entertained regarding them.
2. That they offer a convenient mode of investment for capital, and are generally secure.
3. The increase of debt in Europe has not injured the working classes.
4. That we may expect to see national debts increase at least £100,000,000 a year during the rest of the nineteenth century.

Mining in China.

The following is from a letter of a correspondent of the London Times, dated Peking, June 30:

The cry for opening the mineral treasures of China, which has been in the air for some years, appears now to be on the eve of taking concrete shape. The obstacles to working mines in this country are various. The all-pervading geomantic superstition has been, perhaps, the most constant in its influence, but it is conveniently elastic, yielding whenever required to the pressure of expediency. One of the most formidable obstacles has, no doubt, been the fact that all information concerning the mineral wealth of China has come from foreign explorers, and the most urgent proposals for developing it have likewise proceeded from the same quarter, while the Chinese official classes have an innate and quite excusable repugnance to everything that is tainted with a foreign origin. Not that the natives are wholly ignorant of mineralogy, for they not only scratch the outcrop of their coal seams, but work in primitive fashion copper, iron and other ores, and in some provinces have bored deeply for salt and petroleum. But, notwithstanding these efforts, what is understood by the "development of the resources" of the country is a purely exotic idea. Perhaps the most efficient obstacle of all, however, not only to mining, but to every other form of the economical application of science, lies in the essentially anti-scientific character of Chinese education.

There are other obstacles which have hitherto stood in the way of the initiation of mining enterprise in China, but, to do them justice, the progressive Chinese are seriously endeavoring to surmount them. This they know can only be done by using the "base mechanical" foreigner, which they fear would be to employ a master instead of a servant, and consequently they will restrict the use of the foreign instrument as much as they possibly can. If they could take the foreigner in a dog-leash to certain places and make him hunt for ores as pigs do for truffles, they would prefer that. Indeed, something of the kind is what they have done. The ores found they get analyzed at the seaports—they are getting to know enough of that—and on the strength of results so obtained they proceed to collect capital and invest in machinery, without reference to the conditions of working, the means of transport, or other essential elements of success. Of such abortive enterprises it is superfluous to say more, but some particulars of the only one that can be said to have justified its existence, to the extent at least of proving that it is capable of being worked profitably, may be interesting to those who are watching for signs of progress in China.

The Kaiping Colliery may be considered the prototype of Chinese mines worked by foreign appliances. It originated with the Viceroy, Li Hung Chang, within whose territorial province the works are situated, the enterprise being ancillary to the larger one under the same auspices that preceded it, the Chinese Merchants' Steam Navigation Company. The colliery was intended primarily to supply coal to the Imperial and mercantile steam fleets and to the arsenals which are at work in the metropolitan province, all of which coal had been previously imported from Japan. The colliery is about 80 miles northeast from Tientsin, 120 miles due east from Peking and 30 miles from the nearest deep water, which is at Lu-tai on the Pehtang River, which falls into the Gulf of Pecheli 10 miles north of Teku, at the mouth of the River Peiho. The nearest important market for the coal is Tientsin, which is the terminus of steam navigation and the site of the arsenals. The first problem that presented itself to the promoters of the mine was how to transport the produce to that point. The natural and businesslike solution of this question would, of course, have been a railway direct from the colliery to the market, but even the great Viceroy dared not suggest such an innovation on Chinese ideas. The next best thing was to make the most of the water communication afforded by two navigable rivers running parallel to each other across the intended route. Canals, which offered no Chinese prejudice, were cut, and the result is an extraordinarily tortuous, costly and quite inefficient transport service. It need not be said that the practical English engineers who had the execution of the work protested against the waste involved in the construction and operation of this unsatisfactory system of water carriage, and advocated a railway. But half a loaf is better than no bread, and the canals have done some good. The 22-mile section which connects the Pehtang River with the works, though beneath notice as an engineering work, and containing barely sufficient water for a 25-ton coal barge, has served one useful purpose which was never expected of it—it has drained the land and reclaimed to profitable cultivation a considerable tract of country which formerly lay half the year waterlogged. Even this shallow canal could not be brought nearer the colliery than 7 miles, over which distance consent was with difficulty obtained from the Chinese promoters to lay a mule tramway. The engineers, however, knowing their men, and inspired with a just prescience of the inevitable, constructed their tramway in a solid and substantial manner, and on the 4-foot 7½-inch gauge. As a picture of the way things have to be managed, when they are managed at all in this country, it is worth while giving some details of the tramway.

The colliery, let it not be forgotten, was created by the fiat of almost the highest authority in the Empire, and within the province of which he was the territorial governor. It was part of a comprehensive scheme for utilizing foreign inventions, so as to enable China in time to become independent of foreigners altogether. The execution of the plan was intrusted to a man of singular probity, energy and business capacity, a Cantonese named Tongkin-sing, who recently visited Europe. A stronger combination of authority and energy was hardly possible in China. When the tramway had been laid on the English railway gauge, and the heavy part of the work necessary for starting the colliery was done, Mr. Kinder, the engineer in charge, got together a discarded boiler and sundry scraps of old material, and set his workmen to occupy their spare time in a small shed on a job which attracted no attention from the Chinese proprietors. When the job had been advanced some stages Mr. Tongkin-sing inquired what was going on, but accepted the evasive answer which, in the absence of a mint, is the only current coin in China. Later, when the features of the object began to put on a suspicious resemblance to the drawings of locomotives which appear in illustrated papers, the directors were told it was a toy engine, the construction of which served to keep the men employed, whereupon Mr. Tongkin-sing denounced the duplicity of the engineer and ordered the work to be stopped. Moreover, fearing that the thing might be bruited abroad, Mr. Tongkin-sing waited on the Viceroy and explained to him that he had caught those rascally foreigners making a locomotive, but he had given them a severe scolding, and so he delivered his soul. The Viceroy, of course, applauded his conservative caution, and so delivered his soul. Whatever might be the upshot thereafter, the burden would clearly rest on the shoulders of the foreigner. But Mr. Kinder would have been prepared, if needful, to carry a heavier weight than that, and the work went on, as did the protest, until the completion of the locomotive, which Mr. Kinder was so bold as to label, in the regulation brass letters, "The Rocket of China." The directors had now become so far reconciled to the monstrous creation as to consent to its being used in shunting wagons about the works, but it was forbidden on any pretext to be used on the line, which was being run very badly by mules. By-and-by a passenger carriage was unobtrusively constructed out of waste materials. On one occasion a number of officials and others visited the works and desired to see the canal. It was raining, and there was no means of dry conveyance except the railway carriage, into which the visitors entered, and Mr. Kinder quietly hooked on the Rocket to draw it, telling Mr. Tongkin-sing that, the day being wet, nobody would be looking. The directors protested in the most formal manner, but went; the whole party were pleased with the excursion, and so the railway became a fait accompli. The Viceroy, who was secretly delighted that so much had been done without the heavens falling or the earth quaking, assented to the engine being run regularly, only enjoining on the managers the desirability of thrusting their heads rather deep in the sand, so as to escape observation. Two new locomotives, with other rolling stock, were soon ordered from England, and the "Rocket," having fulfilled its mission, is now preserved lovingly in a shed, where Mr. Kinder, with justifiable pride, shows the pioneer locomotive of China.

Paris, 1878.

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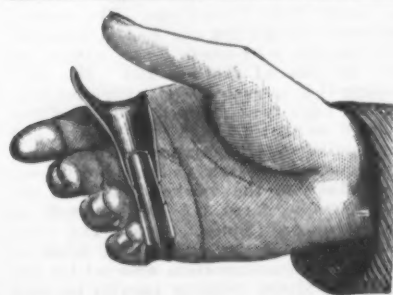
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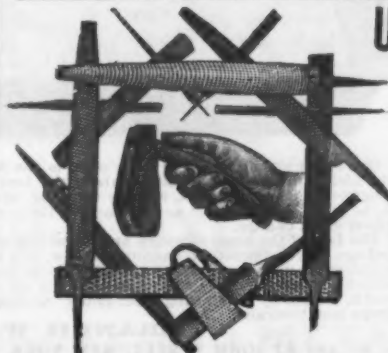
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ties by the spool only. It is a convenience for both dealer and consumer. It is Belin-Coated
and cannot rust; is wound
like spool cotton on quarter
pound, half pound and
one round Spools, one
dozen spools in a box.
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Manufacturers and the Trade are warned not to infringe on our patent, No. 294,750, either by manufacturing
or selling.

The railway is but 7 miles long, but it is
the point of the wedge which is destined to
split the rock of Chinese stagnation.

The colliery itself is well fitted to serve as
a model to other works of a like nature,
having all modern improvements, and the
mining being conducted in a thoroughly
scientific and workmanlike manner. Already
there are 20 miles of excavations through
coal and limestone, underground, 7 miles
of which are laid with rails, the haul-
ing being done by mules. There is coal
enough in the seams to keep the works going
indefinitely without any extraordinary out-
lay of fresh capital. The seams are of differ-
ent quality, and their product is suited to
the different markets which the colliery has
to supply. So far the mine has failed to
meet the market which it was primarily
intended to provide for—namely, steamers
which frequent Tientsin, for whose use coal
has still to be imported from Japan. The
reason for this is that in the seam from
which suitable coal was taken an explosion
occurred, and it became henceforth neces-
sary to work that part of the mine with
safety lamps. But, owing to one of the
most serious defects in the Chinese charac-
ter, the men cannot be trusted, without
foreign surveillance, not to break open the
lamps to get a light to their pipes. The
seam has consequently to be abandoned until
a reinforcement of overmen arrives from
England.

But, although the colliery was established
primarily to supply coal to steamers and
armies, the actual consumption is more
for native, domestic and industrial use. The
coal is sold at the pit's mouth at 9/ per ton,
and the continuous supply of such cheap fuel
has revived local industries, such as lime
kilns, potteries, distilleries, &c., in a won-
derful way. This, of course, only affects
the immediate vicinity of the works, as the
condition of the roads is such as to exclude
from the benefits of the coal all the country
beyond a short radius. But even on the
small scale the demonstration of how such
works would benefit the country in general
is complete. The pity is that some of the
men of "light and leading" in China should
not go and see for themselves. Even the
short makeshift canal has developed a lively
traffic, quite irrespective of the colliery. Long
tires of flat-bottomed boats may be seen
every day ranged along the canal basin, load-
ing and discharging, and a little town has
sprung up to supply the petty wants of this
miscellaneous trade. And so far from the
colliery or the railway offending the prej-
udices of the people, they are both very pop-
ular. The works employ over 1000 men,
900 being underground, and indirectly give
occupation to as many more. The simple
farmers of the district, struck by the fact of
the "steam carts" being able to travel even
in rain—Chinese roads being impassable then—
naïvely petitioned Mr. Kinder to lay iron
rails along their country roads. As a finan-
cial speculation, the Tong Colliery, so called
after Mr. Tongkin-sing, is a failure, but the
reasons for that lie outside of any question
connected with the output or consumption of
coal, and admit, moreover, of being reme-
died by a stroke of the pen. From the point
of view of future developments in China,
the experiment at Kaiping is full of hope
and promise.

**A New Molding Machine for Small
Castings.**

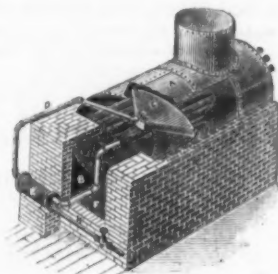
We show in the accompanying illustration
a new molding machine especially adapted
for molding shelf hardware and other work
usually made in snap flasks. It is intro-
duced by the Sweet Molder Company, of
Cleveland, Ohio, and possesses many fea-
tures of interest to foundrymen. An inter-
mittently-rotating molding table has a series
of open sand carriers, provided with move-
able bottom-boards which rest on stops below
while receiving sand, and on spring-dogs
above after it is raised into the drag and
compressed against the under side of the

to pattern. Among the points of interest to
manufacturers might be mentioned the
cheapness of the labor employed, the neces-
sity of only half the floor room now required,
and the ability to run nights and fill large
orders immediately from a single pattern.

We were invited by the manufacturers to
witness the practical operating of the ma-
chine on September 17, which was as fol-
lows: The machine stood on one side of a
small floor, two small cupolas being on the
other. The man who tends the machine
jammed the pattern vertically as it was
raised, and brushed it when necessary,
while two boys carried away molds and a
third placed bottom-boards. Three good-
sized boys did the pouring, while two others
wet the molds and dumped them into elev-
ator buckets, where by power the castings
were separated from the sand, and the lat-
ter tempered and sifted into the machine
hopper. The whole work was done by a
few boys, which otherwise would have re-
quired a number of skilled workmen.

Fordon's Automatic Boiler Cleaner.

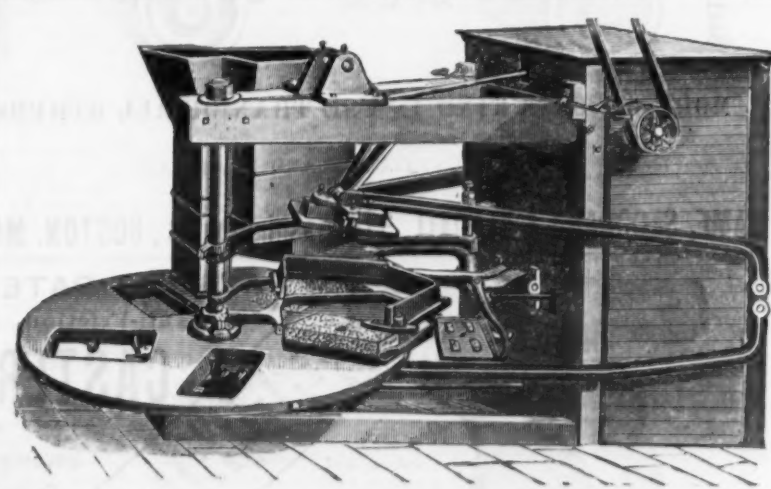
Fordon's automatic boiler cleaner, which
is shown in the cut, is manufactured by
Messrs. Cockshutt & Lord, Central Machine
Works, 41 Bay street, Savannah, Ga., who
own and control the patent right to it for
the Southern States. The working of this
attachment, which can be applied to any
steam boiler, will be understood by referring
to the accompanying illustration showing
perspective and sectional view of a boiler
fitted with the cleaner. A is the shell of the



Boiler with Fordon's Automatic Boiler
Cleaner Attached.

steam boiler. B the smoke-box. C the
skimming pan, which is 7 inches deep and
extends in width nearly across the boiler, its
open side being toward the front of the
boiler, while its rear sides are partly above
the surface of the water. D is a blow-pipe,
which connects with the rear of the pan,
and after passing through the boiler-shell
opens into the settling chamber E. F is a
return-pipe which connects with the settling
chamber opposite the pipe D. H is the blow-
off-pipe, which opens from the settling cham-
ber. When steam is generated a constant
and steady circulation of the water is pro-
duced from the front of the boiler to the
pan, the lighter matter being carried into
the settling chamber E, while the heavier
sediment deposits in the skimming pan.
The water after having passed through the
settling chamber, in which the lighter sedi-
ment was precipitated, returns to the boiler
through the pipe F, the circulation contin-
uing as long as there is any pressure in the
boiler. The sediment in the settling cham-
ber E, as well as the heavier deposit that
collects in the skimming pan, is cleared out
as often as may be necessary by opening the
blow-off H, the frequency of this operation
depending upon the purity of the water
used. The settling chamber, which is sub-
ject to the same pressure as the boiler, is
made of boiler iron, and is tested before using
by a pressure of 200 pounds to the square
inch.

Coupling-Rods with Bushed Ends.
A correspondent writes to the *Locomotive
Engineers' Monthly Journal*: "I am glad to



New Molding Machine for Small Castings.

match-plate pattern. Each carrier passes
under the hopper, where it is filled with
sand and stops under the stationary drag
and over the lower platen. The cope is
filled and struck off by a swinging carrier,
having a movable bottom, which also passes
under a sand hopper. The sand in the two
half-flasks is compressed simultaneously by
the two platens, the upper one carry-
ing the gate-pin. The platens are with-
drawn, the cope is raised, followed by the
pattern half as far, which is then swung out
laterally; the cope is again replaced, the
flasks opened, and the completed mold car-
ried out by the table ready for removal and
pouring. All this is done automatically and
at the rate of from two to four large molds
per minute.

While there is considerable work to be
accomplished by the machine, all the move-
ments are very simple. Eight cams are ar-
ranged on a single vertical shaft in the body
of the machine, and which, by means of
suitable connections, operate the several
parts. Compressing the same amount of
sand to precisely the same extent insures
uniform castings, and jarring vertically in-
stead of rapping sidewise renders them true

see so many of our trunk lines adopting
solid ended side rods, as they are proof
against the abuse the parallel rod with straps
and keys has to withstand at the hands of a
negligent or ignorant engineer. As with
every improvement, there is the usual
amount of prejudice against solid-ended rods
on the part of some engineers. And one of
their objections, and in fact the only one
they can present, is that they rattle so much
after having run a short time. Admitting
such to be a fact, is it not better to hear them
rattle than it is to have cut pins, broken rods
and cabs, and occasionally a ditched train, all
from the cause of the parallel rods not
having the proper care. The most artistic
and strongest rod for the amount of material
used is the double channel section, and with
phosphor-bronze or Ajax metal bushings they
would run a long time without giving any
trouble. I am pleased to note that, in the
new engine No. 132 the company have
recently turned out, they have made a new
departure from the old style of main and
parallel rods. The strap is forged fork shape
solid with the rod, with the back end open,
and fitted to it a block which is held in place
by two bolts passing through the block, the

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NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree, FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES:
E. M. REED,
(Attorney for Defendant.)

G. A. ROBINSON. (L.S.)
O. J. WILSON
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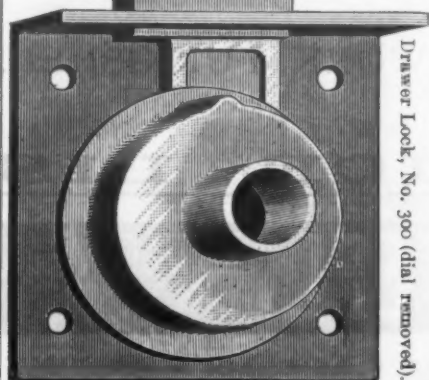


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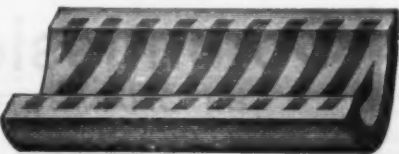


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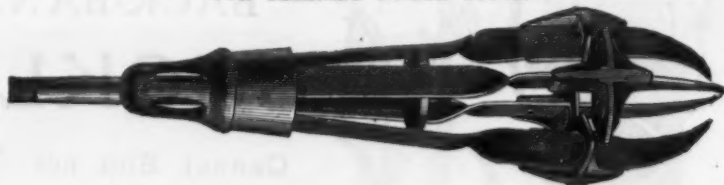
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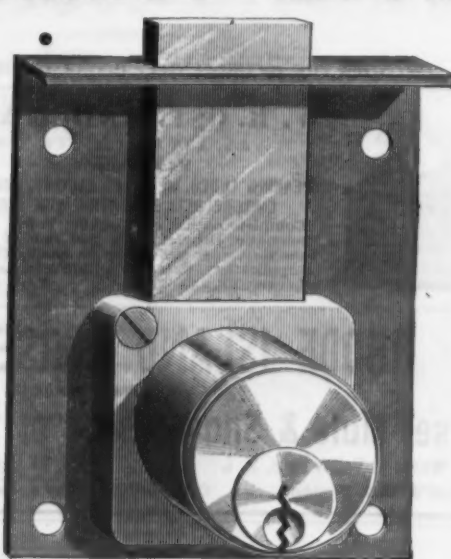
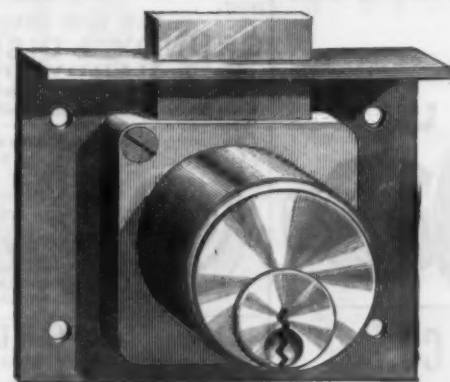


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top and bottom strap holding the brasses in position, and making a very rigid back end. There is the usual key for taking up any lost motion that may occur. The parallel rods are solid-ended, with brass bushings, which do not vary from the usual style of solid-ended rods."

LATEST LEGAL DECISIONS.

SALE—BILL OF LADING—DELIVERY.

S. & Co., of Cincinnati, sold goods to R. at San Angeles, Cal., but in the bill of lading they consigned the goods to themselves there. Then they delivered the bill of lading with a draft on R for the price of the goods to K, who forwarded it to a bank at San Angeles for collection, instructing the bank to hold the bill of lading until payment. Payment, however, was refused, and the draft and bill of lading returned to K. The goods were kept the usual time by the consignees, S. & Co. R claimed the goods, and sought to recover them on the ground that they were sent to him. In this case—*Reynolds vs. Scott*—the trial court decided in favor of the defendant, and R carried the judgment to the Supreme Court of California, where it was affirmed. Judge Sharpsteen, in the opinion, said: "There were two questions which had to be determined in favor of the plaintiff before he could get possession of the property: that it had been delivered to him in the sale; and that the freight had been paid or tendered to the carrier. It is questionable whether the freight in full had been paid or tendered. And as to the delivery, the fact that the vendors took a bill of lading in which they were designated as the consignees militates very strongly against the position of the plaintiff that there was a delivery to him. Benjamin, in his work on sales, lays down this rule: 'Where goods are delivered on board of a vessel, to be carried, and a bill of lading is taken for the delivery to the vendor, it is not a delivery to the buyer, but to the captain, as bailee, for delivery to the person indicated by the bill of lading, as the one to whom they are to be carried. The fact that the bill was made deliverable to the order of the vendor is, when not rebutted by evidence to the contrary, almost decisive to show his intention to reserve the right of disposition, and to prevent the property from passing to the vendor.'

EXCURSION TICKET—EXPULSION FROM TRAIN.

P bought an excursion ticket, which on its face was good for three days, including the day of sale. The ticket was dated December 13, and on December 16 he offered it for his return passage. The conductor refused to allow P to travel on the ticket, and ejected him from the car, for which trespass he sued the company. In this case—*Pennington vs. Philadelphia, Wilmington and Baltimore Railroad Company*—the plaintiff was defeated, and he took the judgment to the Court of Appeals of Maryland, where it was affirmed. Judge Ryan, in the opinion, said: "If a passenger chooses to do so he may stand upon his legal rights, and elect to be carried to his destination without making any special contract with the company, paying the regular rates of fare. The mere purchase of a ticket does not constitute a contract. Before the ordinary liability of the railroad company can be varied there must be a consent of the passenger founded upon a valuable consideration. The ticket, ordinarily, is only a token showing that the passenger has paid his fare. But when the ticket is sold at less than the usual rates, on the condition that it shall not be used after a limited time, if the passenger accepts and uses the ticket he makes a contract with the company according to the terms stated, and the reduction in the fare is the consideration for his contract. It is true he pays his fare before he receives his ticket, but if he has been misled or misinformed by the seller of the ticket as to its terms, he has the right to return the ticket and receive back his money. The railroad company agrees to carry him at the reduced rate upon the conditions stated on the face of his ticket. If he agrees to those terms the contract is executed; but he cannot take advantage of the reduction of the rate and reject the terms on which alone the reduction was made. The offer to pay fare from the station at which the plaintiff was expelled did not entitle him to admission to the car. He was bound to pay his fare from the starting point on his return."

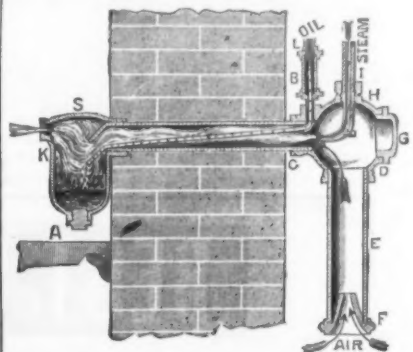
DAMAGES CLAIMED FOR MALICIOUS ATTACHMENT.

A merchant was indebted to one of his creditors for \$1800, and the claim was sent to an attorney-at-law to collect. The attorney proposed that the debt should be secured, and suggested that the amounts due be assigned, and upon the refusal an attachment was levied on the debtor's stock of goods. The debtor, with the aid of his friends, paid the debt and the attachment was discharged, and he sued for damages because of a malicious attachment. There was no evidence that any actual damage was suffered, the plaintiff relying upon the point that the action of the defendant necessarily injured the business of the plaintiff. The defendant had judgment below, and the plaintiff carried the case—*Parmer vs. Keith*—to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Maxwell, in the opinion, said: "Mere inability to pay debts will not justify an attachment. There must be some fraud in making the debt, or some fraudulent disposition of property. But while inability to pay debts is no just cause for an attachment, it may be a material circumstance as tending to prove that the debtor is converting his property into money, or concealing it, for the purpose of putting it beyond the reach of his creditors. The jury have found against the plaintiff as to the suspicion of fraud, thus releasing the defendant from the charge of malice. In order to maintain an action for a malicious attachment the proceedings must have been instituted maliciously and without probable cause. Three things are necessary to be alleged and proved: Want of probable cause, malice in the defendant, and damage to the plaintiff. Malice may be inferred from the want of probable cause, but the inference may be rebutted by facts and circumstances. The fact that a valid cause of

action exists against a debtor is no justification for attaching the debtor's property without probable cause to suspect him of disposing of his property fraudulently. We are in this case of the opinion, however, that the evidence fails to show malice, and, therefore, this suit must fail."

The Orvis Smokeless Furnace.

A great many inventors are engaged at present in attempting to solve the problem of smokeless combustion, both as applied to the use of various soft coals for fuel and for the hydrocarbons that are occasionally employed. Some of them have indeed achieved remarkable success, while others have not advanced so far, but have reached the point where their work promises great utility if carried to its legitimate conclusion. Among those who have so far perfected their apparatus as to be ready to offer the same to the public may be mentioned the Orvis Smokeless Hydrocarbon Furnace Company, whose office is at No. 110 Dearborn street, Chicago. This company are operating under the patents granted in the name of their president, Mr. Orland D. Orvis. This gentleman has long given attention to the subject of fuel combustion, both at home and abroad, and has achieved a reputation on both sides of the ocean. The forms of apparatus which he is at present introducing in this country



The Orvis Smokeless Furnace.—Fig. 1.—Section Showing Arrangement of Parts.

are materially different from those to which he has given attention in his trips abroad. One form of the Orvis hydrocarbon furnace is shown in Fig. 1 of our engravings. It will be noticed that the arrangement of parts involves the principle of the injector. The oil which is to be burned is admitted by a small pipe reaching back into the vaporizing retort. Air is supplied below and in front of the furnace, as indicated by the arrows, through a form of pipe somewhat similar to a blacksmith's tapers. A small jet of steam is introduced, and is applied directly at the opening of this last-named part, all as will be understood by the engraving. The effect of this is to mingle the air and steam, to force them forward with the oil at a high velocity, and to atomize the oil in the vaporizing retort. Accordingly, there issues from the retort a blaze of wonderful intensity, and, inasmuch as a very pure gas is burned, there is no smoke.

Our second figure shows an elevation of the vaporizing retort above described, and indicates the orifice through which the flame of gas is drawn. Several furnaces of the form here described have been put into



Fig. 2.—Front Elevation of the Vaporizing Retort in the Orvis Smokeless Hydrocarbon Furnace.

practical use in Chicago and elsewhere, with very satisfactory results, not only in the matter of avoiding smoke, but also in the economical production of steam. The points which the company claim for this form of apparatus are summed up as follows: Saving of fuel, keeping flues clean, improving sluggish drafts and consuming or preventing smoke. A modified form of this apparatus is applied where soft coal is used, in which case, in addition to the above advantages, those of burning fuel cleanly and preventing clinkers, equalizing heat and burning the sulphurous gases are named. In the use of the apparatus shown in the engravings a tank or reservoir containing petroleum, tar or other liquid hydrocarbons is placed at any desired distance from the furnace. A pipe conducts the liquids to the furnace by gravitation. One or more fine streams are fed by a jet or jets of superheated steam in the manner we have described. The hot steam instantly vaporizes the lighter parts of the oil. The heavier portions fall in the retort, which, being very hot, thoroughly vaporizes them, leaving no residuum whatever. By this arrangement the steam is decomposed and a rich carburated hydrogen gas formed, which is propelled with great force in a thin sheet and in a horizontal plane. As we have mentioned above, this apparatus is used in two forms. Where hydrocarbons are depended upon alone for fuel, sufficient coal is employed simply to keep the retorts hot. Very slight changes are necessary in existing boiler settings to adapt them to the use of this hydrocarbon furnace. It has the merit of being simple in its parts and based upon well-established principles.

Considering the extent of territory and population, says London *Engineer*, the island of Sicily is one of the worst off in Italy as regards railways, and of seven provinces of Sicily that of Syracuse is the poorest of all in this respect. Palermo had to fight 16 years before it obtained a bill for the construction of a line connecting it with Girgenti and Catania, and five or six years more were spent in idle talk as to whether the line should pass by Montedora or Caldare. At last it was decided to direct it through Montedora, but this decision was

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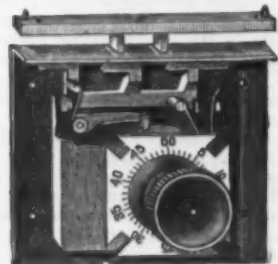
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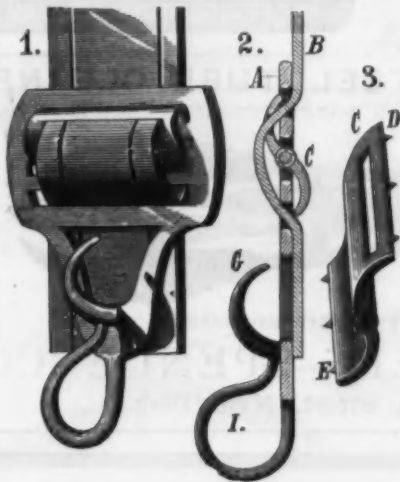
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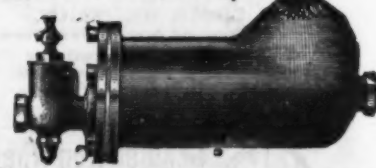
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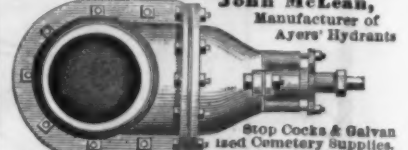
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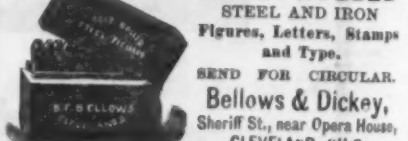
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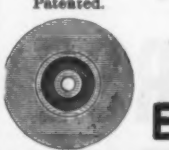
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It represents that part of the packing which, when in use, is in contact with the piston rod.
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subsequently abandoned. The same pro-
crastination has attended the construction of
the line that was decreed in 1879 to run be-
tween Messina and Palermo, along the
northern coast of Italy. Syracuse in 1864
was placed in communication with Catania
and Messina by a line along the coast, but
the interior of the province was not much
benefited, and in 1879 a decree was ob-
tained for the construction of a line between
Syracuse and Licata. The Italian Govern-
ment, however, seems to be in no hurry to
begin the works, and it not yet decided
what course the line will take. For want of
means of communication, the once impor-
tant town of Sciacca has lost its trade and
industry, and has much retrograded of late.
A bill was accordingly passed some time
ago for the construction of a line connecting
Palermo with Sciacca via Corleone, and
already the preliminary steps of expropriation
have been initiated.

New Inventions.

An ash sifter of new form is composed of
a rotary cylindrical sieve mounted in an
inclosing box and provided with a movable
partition which is slid across the box beneath
the cylinder when the sifting is finished.
This partition constitutes in this position an
inclined chute on which the cinders may be
dumped and by which they are discharged
through an opening in the box. The cylind-
rical sieve is fitted around two wooden
heads and is provided with a movable wire-
cloth section, which permits the insertion
and removal of the material to be sifted.
After the discharge of the cinders the parti-
tion is removed and placed on top of the
box, and the discharge opening will be
automatically closed. Thus the box is pre-
pared for the next operation. This ash
sifter has been patented by B. H. Cook, of
Brooklyn, N. Y.

A strong belt and pulley frame with a
reduced number of spokes has been invented
by C. B. Ball, deceased, M. H. Ball, of
Madison, Wis., administrator. The hub,
spokes and rim are made of cast iron, and
the ends of the spokes at their junction with
the rim are enlarged and flanged to brace
the parts at that point. An exterior band
is heated and placed around the rim in a
similar manner as tires are secured to wheels.
The band is broad and extends some distance
beyond each side of the rim, so that the
pulley frame is protected from accidental
blows. The rim strengthens the spokes at
their ends and also prevents their being
broken by the springing of the exterior
band.

Screw-threaded ferrules and nipples are
cut and threaded in a machine patented by
W. & J. Maiden and E. F. Cowley, of Hyde,
England. Three cutters are used, fitting side
by side within an inwardly-tapering groove
of the cutter-bar. The central or main cutter
is set in advance of the sandwicheing cutters
and performs the cutting-off operation,
while the latter do the required beveling. In
this way a clean cut is made without raising
a burr. For screw-threading the ferrule,
the hub of the cutter-head is made tubular
and provided with radial screw-cutting dies.
A pair of these dies are mounted in diam-
etrically opposite dovetailed grooves in the
face of the hub, and the inner end of each
die is recessed to form three cutting edges,
distributed around the circumference of the
tube to be operated upon. For automatically
forcing the dies inward when the cutter-
head is revolved cam projections are formed
within the front of the cutter-head, and for
retracting the same automatically when the
motion of the cutter-head is reversed it is
provided internally with cam grooves co-
acting with stud-pins on the dies.

The Card-Dane Dry Gold Sluice Company,
Limited, of La Crosse, Wis., have procured
a patent for a dry-ore separator. The aurif-
erous material is fed to a hopper and runs
down upon an endless wire-cloth belt which
is traveling in an upward direction. At the
same time an air current is being drawn up-
ward and outward through the belt, and in
combination with gravity causes the lighter
or refuse mass to float downward, so as to
pass out of the machine. The gold or
precious metal remains on the belt and is
carried over its upper end and discharged
into a chamber from whence it can be re-
moved.

James Smith, of Boston, Mass., has im-
proved the construction of dies for forging
the journals of car-axles. The hammering
portions of the dies in cross-section are made
arcs of circles whose centers lie in the
plane of the meeting faces of the die blocks.
The dies form, when the blocks meet, com-
plete circles excepting at the meeting faces,
where they are enlarged or widened. This
affords room for the lateral displacement of
the metal, which will form gentle protuber-
ances. These can be readily reduced by
rotating the axle and thus bringing them
under the hammering portions of the dies.
The journal is thus hammered to a perfectly
cylindrical form, and has the same diameter
as the space inclosed by the dies.

W. H. Clark, of Chicago, Ill., has pat-
ented a cushioning device for shafts which is
to prevent the shock and strain on an engine
and driving mechanism consequent on meet-
ing a sudden resistance. The cushion is
composed of two coiled springs located be-
tween the power and the load and arranged
to take the resistance of the load and pre-
vent its transmission to the power, except
in such a gradual manner as not to result
in injury. The cushion is so constructed
that no matter how much the resistance
may be varied it will always be properly
compensated for, or, in other words, the ef-
fects of the resistance is transmitted to the
cushioning device, instead of to the driving
parts of the machine. The claim of the
patent covers a cushioning device between
the power and the load, and operating to re-
lieve the strain under varying resistance on
either a forward or reverse movement of
the shaft.

J. Richards, of San Francisco, Cal., is the
patentee of a metal boring and slotting
machine containing some new points. The
reciprocating motion given to the cut-
ters is derived from the same mechanism
which feeds the bars in boring and turning.
The sliding saddles which carry the cutters
or spindles receive their motion by a right
and a left screw. Each saddle has two nuts,

one for each screw, so that by connecting
the saddles to different screws at will the
lateral feed of the saddles can be in-
dependent, and thus started, stopped or
reversed without changing the feed driving
gear. The rate of feed can be made to be
greater or less on either saddle as the work
may require.

B. Brazelle, of St. Louis, Mo., has patented
a machine for making hook-headed nails of
the class formed of a metallic strip with
either a single or a double point at one of its
ends. Nails of this description are used for
retaining metallic hoops in position on kegs
and other vessels. The blank is led from a
suitable reel to and between two feed-rollers,
while a rubber spring feeds it to the dies.
When the end of the blank abuts against a
stop the feed is stopped, and by the descent
of the movable die a nail is cut and bent to
the desired form. A discharge-rod pushes
the finished nail from the former, while the
feed-rolls resume their rotation to move the
blank forward for cutting the next nail.

M. Hatfield, of Marshall, Mo., has patented
a tool for pressing upon round or flat bolt-
heads when the nuts are to be unscrewed.
The tool consists essentially of a metal bar
that is drawn out at one end to form a bifur-
cated chisel-shaped tool. Upon the bar
slides a jointed lever, the lower arm of which
is bent upward to form a hook. In use the
tool is pressed upon the bolt-head, while the
hook is inserted under the work and forms a
fulcrum. The tool is designed more particu-
larly for blacksmiths, carriage-makers and
farmers who do their own repairing.

A tray upon which fish may be cooked and
from which it may then be removed without
breaking has been invented by C. M. Bon-
neau, of Boston, Mass. The tray consists of
two sections of perforated sheet metal. These
sections are connected during the cooking
operation by means of a pin entering corre-
sponding eyes. After the tray has been placed
upon the dish on which the fish is to be served
the sections are detached and separately
drawn out from under the fish, which is thus
deposited upon the dish without being broken.

A wire fence with an attachment that
will serve for a brace for the horizontal
strands, and also as a cattle guard, has been
patented by C. R. Bentley, of Dubuque,
Iowa. The horizontal barbed strands are
stretched between the posts in the ordinary
manner. Metallic upright wire bands are
bent around the strands at suitable inter-
vals. A tongue is formed in the bands at
each end, and when a band has been bent
around the strands this tongue is passed
through a hole punched in the adjoining
metal and compressed to secure the band in
place. Any number of these fasteners may
be secured between any two posts.

An improved contrivance for centering
and tightening the sliding jacket of the
grinding millers of amalgamating pans on
the driving spindles has been patented by
A. Wallace, of Leadville, Col. The socket
of the jacket is made square or of other
angular form, and the spindle is made with
corresponding sides, but sufficiently small to
enable wedges to be used between the sides
of the spindle and the side walls of the
socket of the jacket. To facilitate the ap-
plication of these wedges they are connected
to the sides of the walls of the socket by
stud-bolts projecting out through slots of the
jacket, to hold the wedges in place after the
jacket has been adjusted to the shaft. The
wedges are to be sufficiently slack to enable
the jacket to be shifted up and down on the
spindle according as it is desired to adjust
the miller. By means of these wedges the
jacket may be set to run true, even though
the spindle may vibrate to some extent.

An apparatus for coating the interior of
brick-lined molds with a smooth, hard plaster-
ing surface has been invented by G. W.
Billings, of Cleveland, Ohio. The apparatus
consists of a cylinder which is perforated
with numerous holes and which contains a
plunger that may be forced down by a hand-
wheel. The plunger has two openings
through which the charge is first introduced,
after which the openings are closed by
covers. The cylinder, properly filled, is
introduced into the mold and then moved
back and forth while the follower is forced
down. The charge will thus be squeezed
out through the perforations, and as the
cylinder is continuously drawn back and
forth the charge is plastered over the mold
and finally smoothed down until the interior
of the mold presents a perfectly smooth
cylindrical surface. The coating is allowed
to dry, as usual, and the mold is then ready
for use in the usual manner.

An apparatus for securing the rapid de-
composition of ores or alloys and preventing
deposition of the dissolved metals upon the
cathode has been patented by H. R. Cassel,
of New York City. The ore is placed in a
rotary drum or anode compartment, together
with a solution of chloride of sodium, and
the drum is then connected with a dynamo
machine and revolved on its axis within a
tank which constitutes the cathode compart-
ment. The ore will be continuously agitated
by carbon rods arranged around and near
the outer circumference of the drum. The
chlorine generated in the drum will reach
every particle of metal and convert it into a
chloride. The body of the drum is composed
of a porous material which prevents the dis-
solved materials from being precipitated
upon the cathode. The chlorine within the
drum may be allowed to escape from time to
time through a cock. The solution will
become more or less saturated, according to
the richness of the ores under treatment.
When fully saturated, or before it is filtered
off, metals therein may be precipitated by
proper reagents.

Roughan Brothers, of Boston, Mass., are
the patentees of a coal barrow made entirely
open at the rear and having floor, sides and
front pieces only. The floor inclines upward
at a considerable angle from the front, so
that the coal will not spill until the barrow is
dumped. With the old barrows the large
lumps frequently catch and clog between the
swinging tail-piece and the floor, and thereby
violently tip up the front end and handles.
This damages the barrow, and may also
injure the operator. The new barrow, it is
said, entirely overcomes this objection.

A furnace which has a cooling attachment
for the fire-grate and ash-pit forms the sub-
ject of a patent issued to H. W. Peaselee, of
Malden Bridge, N. Y. The grate-bars rest
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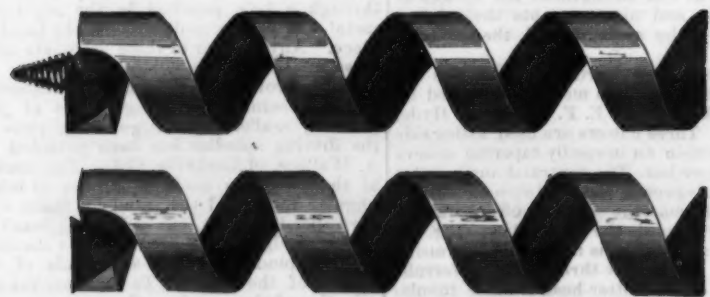
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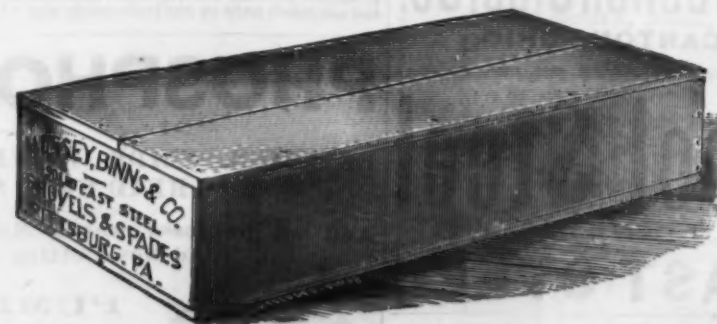
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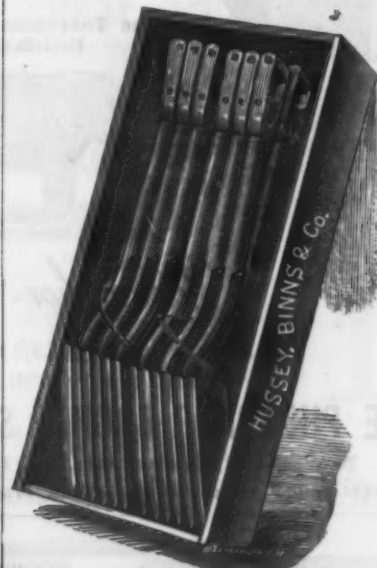
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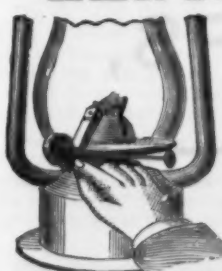
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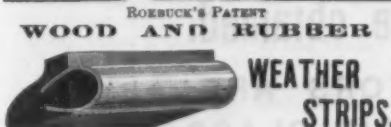
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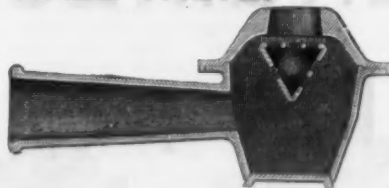
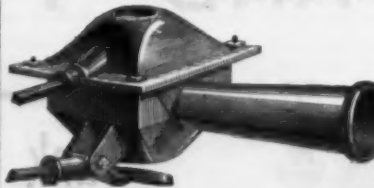
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a cold-water supply at one end and with a discharge-pipe at the other end. From the discharge-pipe extend a number of perforated pipes below the grate for discharging water in the form of a shower into the ash-pit. The shower-pipes may be used independently of the water-pipes by connecting them directly to the water supply. Proper stop-cocks are placed in the shower and water pipes.

A new way of securing the blade of a knife or fork to the bolster has been patented by J. W. Gardner, of Shelburne Falls, Mass. The bolster is made with a slot to receive the inner end of the blade or tine, and with a seat or socket to receive a projecting tang formed on said end. The blade or tine is secured in place by a transverse tapering pin passing through the bolster and through a notch in the blade. The above construction, it is claimed, relieves the pin materially from strain and prevents its wear to a considerable extent.

Remarkable Decline in British Exports of Iron and Steel.

In our last issue, says the *Bulletin* of the American Iron and Steel Association, we gave the statistics of the great decline in the production of iron and steel in Great Britain during the first six months of the present year. Information since received shows that the decline in production has been still further accelerated in July, August and September. Only one-half of the furnaces of Great Britain were in blast on the 1st of September. The causes of this great depression are to be found in the greatly decreased demand by foreign countries for British iron and steel products. The export statistics tell the story of shrunken markets, and they afford good ground for the belief that Great Britain has at last reached the pinnacle of her greatness as an iron and steel producing country. In 1883 her production of iron and steel was less than in 1882; this year it will be much less than in 1883. The reason is that the other countries are devoting their attention more and more every year to the supply from home resources of their iron and steel wants, and they are doing this, too, in a manner so thorough and scientific that the industries thus established are going to stay. Excellence in quality and variety of product are accompanied by cheapness in price, which is the only remaining requisite that is necessary to secure possession of the home market and to exclude British products. For her export trade in iron and steel Great Britain must mainly rely hereafter on the orders which may come to her from her colonies. The leading Continental countries of Europe and this great country have set up for themselves as iron and steel manufacturers. How Great Britain is feeling the effects of this challenging of her supremacy as an iron and steel manufacturer is seen in the following summary statements:

In the month of August last the total exports of iron and steel from Great Britain to all countries amounted to 273,437 tons, against 365,500 tons in August, 1883, and 432,972 tons in August, 1882. In the first eight months of the present year the total exports of iron and steel from Great Britain to all countries amounted to 2,380,641 tons, against 2,699,293 tons in the same period of 1883, and 2,931,144 tons in the same period of 1882. The shrinkage in the exports above summarized has not been principally confined to the United States, as might at first thought be supposed, but has embraced Germany, France, Russia and other large iron and steel consuming countries. It has affected nearly all British iron and steel products, but especially pig iron and iron and steel rails. The statistics of the exports to the United States for the periods for which total results have above been given are as follows, and require no comment:

Products.	Month ending August 31.		
	1882.	1883.	1884.
Pig iron.....	Tons, 67,000	Tons, 59,314	Tons, 11,907
Old iron.....	4,916	1,181	963
Steel unwrought.....	8,476	957	865
Tin plates.....	30,709	21,114	15,544
Hoops and sheets.....	5,349	3,697	4,778
Bar, angle, bolt and rod.....	1,477	85	631
Cast and wrought.....	442	352	379
Iron and steel rails.....	13,385	9,623	1,293
Total.....	124,368	66,053	35,739
8 mos. ending Aug. 31.			
Products.	1882.		
	1883.	1884.	
Pig iron.....	Tons, 341,780	Tons, 198,175	Tons, 114,463
Old iron.....	64,581	37,324	18,839
Steel unwrought.....	112,325	34,398	2,014
Tin plates.....	148,671	14,734	145,051
Hoops and sheets.....	24,665	22,829	13,805
Bar, angle, bolt and rod.....	14,758	5,708	5,510
Cast and wrought.....	4,557	8,774	2,080
Iron and steel rails.....	155,408	49,827	16,438
Total.....	866,640	484,935	323,700

The above figures relate to quantities. If the statistics of values for the same periods be examined it will be found that Great Britain is losing a great deal of money through the decline in her exports of iron and steel. In August, 1882, the value of these exports was £2,884,576; in August, 1883, it was £2,397,312, and in August, 1884, it was £1,825,568. In the first eight months of 1882 it was £21,255,685; in the first eight months of 1883 it was £19,260,102, and in the first eight months of 1884 it was £16,575,791.

Failure of the St. Louis Malleable Iron Works Company.—According to an Associated Press dispatch from St. Louis, of the 26th ultimo, the Malleable Iron Works Company filed an assignment, designating John T. Davis, of Samuel C. Davis & Co., as receiver. The assets are placed at \$111,000. The company employ about 200 men. The officers are H. M. Filley, vice-president, and B. G. Farrar, secretary. The liabilities, as given by the secretary, are: Third National Bank, \$30,000; pig-iron notes due firms in Chicago and Detroit, \$8000; floating debt and current expenses, \$5000; note to H. M. Filley, \$18,000; total, \$63,000. The assets are listed as follows: Buildings and leasehold, \$27,000; machinery and fixtures, \$58,000; pig iron and scrap iron, \$8000; manufactured product and product in process of

manufacture, \$15,000; outstanding account, \$3000; total, \$111,000. The failure was caused by the apprehension of being annoyed by small creditors, and at the suggestion of Mr. Tutt an assignee was named in order to protect the \$30,000 due the Third National Bank. This debt was incurred by reason of the necessity for improved machinery to fill the largest contract of the kind ever made in the country—the manufacture of 40,000 ranges for the Wrought-Iron Range Company. Then the company took an additional contract to make 65,000 washers for the Missouri Steam Laundry Company, and more money had to be borrowed. The secretary says the foundry is temporarily closed, awaiting the return from New York of Oliver D. Filley, who will bring sufficient money to reopen the works. The company were founded 14 years ago. The parties who now compose the company purchased the site and works from the Campsprings Malleable Iron Works, owned by Geo. W. Shapleigh.

International Exhibition of Inventions.

Arrangements are in progress for holding next year an international exhibition of inventions and musical instruments in the exhibition buildings, Royal Horticultural Gardens, South Kensington, London. The coming exhibition will be the fourth one of a special nature that has been held in London of late years, the Smoke Abatement Exhibition of 1881 having been followed by the Fisheries Exhibition in 1883 and the Health Exhibition in 1884. These special exhibitions, which are supplanting in some degree the general exhibitions, are a natural result of the growing diversity of industries which is constantly adding to the number of manufacturing, commercial and other interests that desire representation at an international exhibition. The coming exhibition in London is not in any way under the control of, though sanctioned and assisted by, the English Government. It is managed by a council appointed by the Prince of Wales, with Sir Frederick Bramwell as chairman. The members of the Executive Council include Mr. L. Lowthian Bell, Professor Dewar and many others of equally high position. Being under the control of such men, it is safe to assume that the exhibition will be a most successful affair.

The exhibition will be opened in May, 1885, and will continue for a period of about six months. Division I, Inventions, will be devoted to illustrations of apparatus, appliances, processes and products invented or brought into use since 1862. Division II, Music, will comprise examples of musical instruments of a date not earlier than 1800, together with historical collections of instruments and kindred articles. Medals and diplomas of honor will be awarded for exhibits on the recommendation of juries. No charge will be made for space, but exhibitors will have to pay all expenses of conveyance and erecting or arranging of exhibits. The collection of inventions is intended to bring before the public the progress which has been made during the last quarter of a century in applying the discoveries of science to the purposes of daily life. For this purpose there will be exhibited not only the apparatus, or a model or diagram of it, by which the process is carried out, together with the product, but there also will be shown the working of a limited number of industrial processes in their consecutive stages. Applications for space from foreign exhibitors will be received up to the 1st of November. Any further information concerning the exhibition can be obtained from Mr. E. Curcliffe-Owen, secretary of the exhibition, South Kensington, London. Mr. Edwards, the acting consul-general for Great Britain in New York, will furnish papers and forms on application.

Pittsburgh Secures New Orleans Contracts.

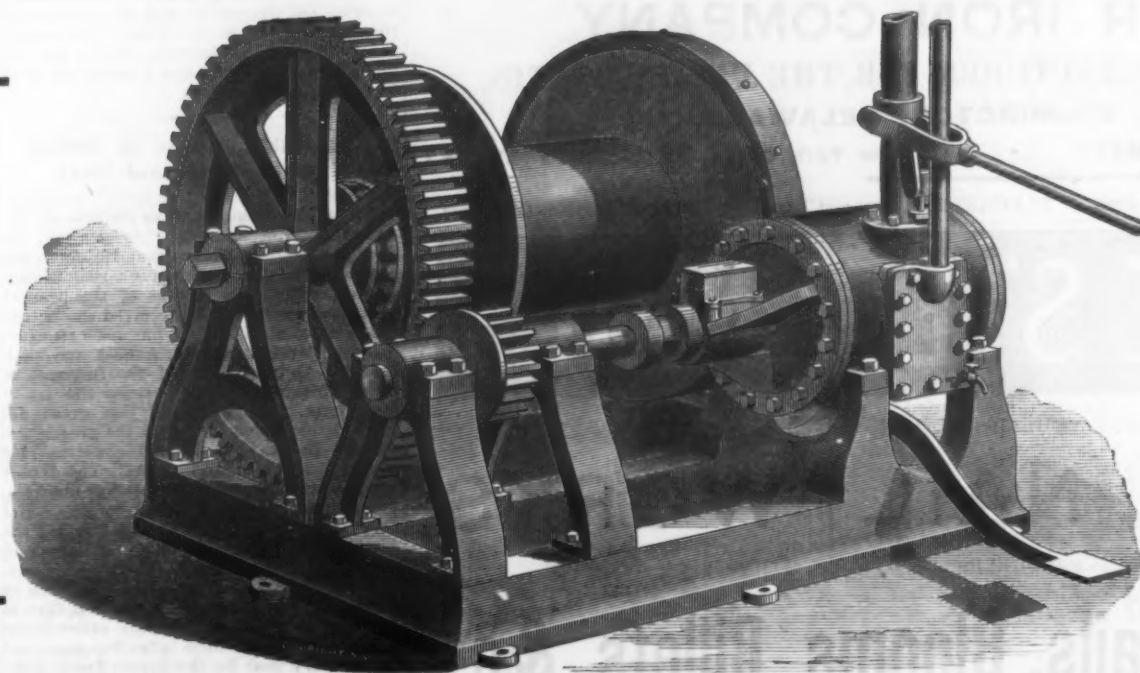
The manufacturers of this city, says the *Pittsburgh Dispatch*, have been unusually successful in gaining recognition in the awards made by the managers of the Louisiana Exposition. This world's fair is to be opened, if the plans do not fail, on December 1, 1884. A large number of iron and frame buildings are to be erected by the different Governments of the civilized world, and the exhibits give promise to even excel those at the Centennial Exposition in Philadelphia. In addition to these outbuildings, a large and roomy main hall is to be constructed on a very elaborate scale, one that will do credit to the grit and business enterprise shown by the New South. In this city four firms have obtained large contracts. They are Hoover, Hughes & Co., Jones & Laughlin, the Keystone Bridge Company and one other firm. At the office of the first-mentioned firm it was learned that Mr. Hughes is now in New Orleans making preparations for work to be done on the Mexican barracks, a large pavilion to be made of wood, and in which will be shown the different arms and implements of war used by the army of Mexico. The Keystone Bridge Company have received the contract for a large iron pavilion to be built by the Mexican Government. The iron for this pavilion will all be shipped from here, and there will be not less than 100 carloads sent to New Orleans between now and winter. The contract was awarded for \$100,000, and the extra work may run that figure up several thousands more. The shape of the pavilion will be octagonal, the roof and sides to be constructed of iron and glass, and the interior to be inlaid with rich designs in mosaic. Jones & Laughlin's contract covers all the shafting for machinery in the main exposition hall, and will consume thousands of tons of the best steel that can be turned out by their mill. Their bill for the work may exceed \$150,000. Another firm here have three contracts for as many iron structures to be erected by foreign Governments. They will get in return for the labor expended something like \$100,000—probably much more. No workmen have been sent to New Orleans from here nor is it at all likely that there will be, for more than enough mechanics of all trades are down there now.

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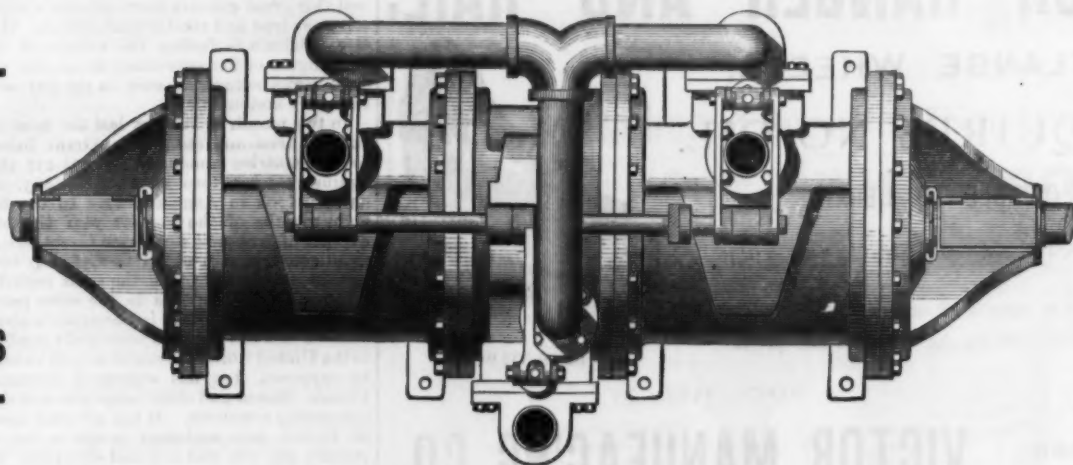
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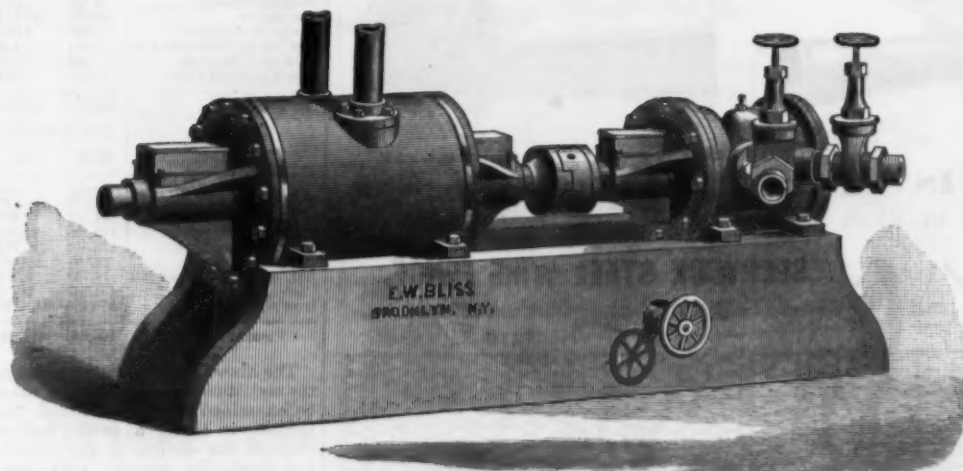


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INDUSTRIAL ITEMS.

MAINE.

Fay & Scott, Dexter, have moved the machinery into their new shop and have a large portion of it running. Work on their foundry building is progressing rapidly, the brickwork being completed. Their new quarters are first class in every respect, having an abundance of light and power, with room for future enlargements. The machine shop is 80 x 40 and two stories high, and the foundry is 80 x 30. The motive power is furnished by a new and powerful turbine wheel. Their business is the manufacture of machine tools and patent specialties.

MASSACHUSETTS.

The puddlers at the Fall River Iron Works commenced work on Monday morning of last week. Their wages have been reduced 25 cents per ton. This reduction only brings wages to the same rate paid by other companies in the same branch of business. It is understood that the employees in the other departments will have their pay reduced to what is paid at other iron works.

McCloud & Crane, of Worcester, having consolidated their business with Henry Minter, announce that they will occupy the building No. 57 Union street. The firm will be known as McCloud, Crane & Minter, and will manufacture iron and steel set-screws, hexagon, square and round-head cap-screws, studs and finished case-hardened nuts. They keep in stock all regular goods in their line.

The Worcester Machine Screw Company, of Worcester, are very busy on orders, and are running as large a force of hands as during the "boom." In addition to their machine screw, which is a specialty, they manufacture a full line for the electric-light and telephone machines, which are in such constantly increasing demand.

The Weir Stove Company, of Taunton, have recently bought a large tract of land, and will at once enlarge their works, which are already the largest of the kind in that city.

The shops and works of Babbitt, Wood & Co., of New Bedford, cover about an acre of ground, and at full running capacity employ about 30 hands in the manufacture of boilers of every description, tanks, heaters, sheet and galvanized iron work. The concern, which was established four years ago, has recently built a convenient office at 32 Commercial street, and connected it with a building where they now do all kinds of steam fitting and piping, and also a brisk business in the furnishing of steam fitting, piping and engineers' supplies.

CONNECTICUT.

The Wilson Sewing Machine Company, of Wallingford, say that they have not authorized the statement, now being circulated, that they will soon begin to manufacture bicycles.

Among orders recently received by Beecher & Peck, of New Haven, is one for a drop press, the hammer of which will weigh 2500 pounds, the entire machine to weigh about 14 tons.

NEW YORK.

The Lidgerwood Manufacturing Company, 96 Liberty street, New York City, in order to meet the demand for their superior hoisting engines, have just completed the addition of a boiler shop, which is L-shaped, 120 by 102 feet on the sides and 50 feet deep. They are now prepared to make iron or steel boilers of all sizes, including marine as well as stationary. They employ 200 hands in their works, and are running full time. They also manufacture stationary engines, which are having a good sale, and are known as the "L" engine. The company report orders as coming in rapidly and look for a good fall trade.

For the sixth time the Bradley's cushioned helve hammers, manufactured by Bradley & Co., of Syracuse, have received the highest award, the grand silver medal, at the Cincinnati Exposition. They have never been exhibited without taking the highest prize.

The King Iron Works, at Buffalo, belonging to Duckworth & Co., manufacturers of nuts, bolts and hardware, were burned on the evening of September 22. The loss on the building and machinery is \$30,000.

NEW JERSEY.

The Ferracite Machine Company, of Bridgeton, are busy with 70 to 80 hands on special sheet-metal machinery for various parties. They make a great variety of foot and power presses, and intend soon to bring before the public a new line of presses for heavy cutting and punching work.

PENNSYLVANIA.

The Baldwin Locomotive Works, of Philadelphia, have just completed an order of 20 freight engines to go to New South Wales. Orders for heavy freight engines for the Missouri Pacific and the Washash, St. Louis and Pacific railroads are now in progress.

Messrs. Grove, Grier & Co., Limited, 330 Walnut street, Philadelphia, with furnaces and mills at Danville, manufacture steel washers of from 1/4 inch to 4 1/2 inches diameter, with size of holes varying from 1/4 inch to 2 1/2 inches diameter. These washers are being used quite extensively on railroads, and are said to give satisfaction wherever employed. The advantage claimed for steel is that, being stiffer than iron, the washers, where used against wood or other soft substances, bear evenly and do not buckle up. A further claim is that they do not readily split, and have greater durability when subject to friction. The company make and roll all the steel which is used in their washers.

The Phoenix Iron Company have announced a reduction of wages, to go into effect October 1. Puddlers will get 25 cents a ton less; other mill labor will suffer a reduction of 6 per cent., and laborers getting \$1.03 a day will be paid \$1. Mechanics in the shops are not affected.

The coke operators of the Connellsville region are complaining about a scarcity of water. For a couple of weeks past a number of firms have had to draw the water used from the mines. The water thus ob-

tained contains a large percentage of sulphur, and the coke made with it is considered of an inferior quality. A considerable quantity has been refused by a number of furnacemen during the past week, and the coke has been shipped back. The ovens which are supplied with good water are now being run to their full capacity. There are enough controlled by the association to supply the market.

The Reading Nickel Plating Company shipped 10 tons of their product on September 24 to a firm in Phillipsburg, N. J. This is the largest shipment of nickel-plated goods ever made from that city.

Superintendent Edward Edwards has introduced into the Ferndale Rolling Mill of the Cataqua Manufacturing Company three 500 candle-power Siemens regenerative gas lamps, and is greatly pleased with their working. The lamps are fed with gas from the "Peerless" gas generator, and the employees are greatly facilitated on the night turn. The advantages of the light are claimed to be greater than those of electricity, it being more economical, giving a white flame, remarkably steady, and the light being admirably diffused. The illumination is said to be three times greater than is secured by the same amount of gas consumed in an ordinary burner, and greatly lessening in a crowded building the unhealthy condition of the air in which gas is burned.—*Cataqua Dispatch*.

The Philadelphia and Reading Company's rolling mill in North Reading, which closed last month, will be reopened next Monday for the manufacture of railroad splice bars or "fish plates." Preparations are now being made for the resumption of work.

A telegram states that the Fairview Nail Works and the Paxton Iron Works, of Harrisburg, and the Duncannon Iron Works, of Duncannon, have posted notices of a reduction of 10 per cent. in wages, to take effect on Monday, October 6. The Chesapeake Iron Works, of Harrisburg, have posted a similar notice. The four establishments give employment to several thousand hands.

A reduction of 20 per cent. in the salaries of officers, and of 10 per cent. in the wages of employees, has been made at Powellton Furnace, owned by R. H. Powell's Sons & Co., at Saxton. The company say that this must be submitted to, or that they must close operations on account of the depression in the iron trade.

The Bessemer mill at the Pennsylvania Steel Works, in the 24 hours ending at 7 o'clock on the morning of September 20, ran 99 heats with two cupolas and two converters, or a total of 694 tons of steel. This is asserted to have been the largest run on record for the time.

The E. & G. Brooke Iron Company, of Birdsboro', are about placing 25 new nail machines in their factory, one-half of which will be self-feeders. There are now 218 machines in operation.

The Southwark Foundry and Machine Company, 430 Washington avenue, Philadelphia, have recently placed a pair of their Porter-Allen automatic out-off steam engines, 14 1/2 x 24, in the post office at Philadelphia. These engines are to be used for electric lighting, and being high speed are admirably adapted for this purpose. One has been in constant use night and day in the New York Post Office for over seven years, and is running now without a perceptible jar, and apparently as good as new. Two are in the Boston Post Office, two are in the Chicago Post Office, and two are in the St. Louis Custom House—all used for electric lighting. The company have six of their engines running at the Electrical Exhibition in Philadelphia.

PITTSBURGH AND VICINITY.

The Pittsburgh Bessemer Steel Works are succeeding in making Bessemer steel of remarkable uniformity—so much so, that it threatens to supplant open-hearth steel for many purposes where the use of the latter has hitherto been considered indispensable.

The Lewis Foundry and Machine Company, Limited, have just cast, for their own use, one of the largest roll flasks in the United States. Its weight is about 7 tons, its inside diameter 4 feet 2 inches, its length 13 feet, and it has capacity for casting rolls 48 inches in diameter.

The firm of H. E. Collins & Co. has been dissolved by the retirement of James H. Murdock. The business will be conducted as heretofore, under the same firm name, by H. E. Collins. Mr. Murdock has formed a co-partnership with C. C. Murdock, under the name of Murdock & Co., to carry on a general brokerage business at Pittsburgh.

A company is now being organized in Pittsburgh for the manufacture of carbons by a new process, of which a well-known Ohio inventor is the patentee. The company starts out with a capital stock of \$300,000. It is claimed that by the newly-discovered process carbons can be manufactured at half the present cost of production. If the project is successful it will materially reduce the cost of electric light.

Two wells have been drilled near McKeesport in search of gas, but have been abandoned. In one, that of W. D. Wood & Co., gas was reached at 1400 feet, but on increasing the depth 50 feet water was struck in such quantities as to preclude all possibility of using the gas.

Both the Brace Brothers' and the Zimmerman wells, near Wilkinsburg, have been given up as "dusters," but little gas having been found. The depth attained at each of the wells was 1500 feet.

The firm of Moorhead, Brother & Co., operating the Vesuvius Iron and Nail Works, at Sharpsburg, has been dissolved by the retirement of Allan C. Bakewell. Messrs. Frank T. Moorhead and John Moorhead, Jr., will continue the business under the old name.

Another natural-gas well was struck at Tarentum last week, near Bull Creek. It is stated that a Massachusetts firm will build an industrial concern there and utilize the well for fuel purposes. The laying of gas-pipes through the streets of Tarentum has now been completed, and several dwelling-

houses have made connections with them. Cooking stoves and grates are supplied with the gas, and some persons have put in fixtures to use it for illuminating purposes.

A hole was burned in the roof of the Atlas Works, Limited, on last Thursday. But little damage was done.

Moorhead, McClean & Co., who have been repairing Soho Furnace for some time, are now ready to blow in, but are without employees, their hands refusing to accept the wages offered.

The miners' camp in the Fourth Pool is still continued. Many of the strikers are very much dissatisfied, but the feeling is still very bitter, and it does not seem likely that there will be an early end of the strike.

The railroad miners' convention which met on Saturday, September 20, decided in favor of instituting a new board of arbitration. Of the 17 delegates present, representing all the districts, only two opposed the measure. A resolution was passed urging upon the tribunal the necessity of giving the checkweighman the power to stop the car or as many bushels as are necessary to pay his wages. It was further decided to levy a tax of 15 cents per man, to be collected and paid into the general office, to defray the expenses of arbitration.

The Window Glass Works of Abel, Smith & Co., and the pattern shop and machine shop of Robinson, Rea & Co., on the South Side, were destroyed by fire last Friday night. The origin of the fire is unknown, but is attributed to a spark from one of the glass furnaces. Robinson, Rea & Co.'s loss is estimated at \$100,000, which is pretty well covered by insurance, and that of Abel, Smith & Co. at \$60,000, on which there is \$31,000 insurance. Both firms will rebuild at once.

The Fuel Gas Company are laying another 10-inch main from Pittsburgh to Murrysville. The pipe was laid as far as Homewood, where the company drilled two wells some time ago, but the wells proving failures the main is to be continued to Murrysville.

The stove molders' strike, under the influence of the recent settlement at Cincinnati, is nearing an end. It is stated that a committee from the local union has been appointed to confer with the manufacturers.

A company known as the Morgan Star Barbed Wire Company, Limited, has filed articles of partnership in the recorder's office. The capital stock is placed at \$250,000. Thomas Henry Morgan is chairman; M. E. Harrison, secretary; O. D. Lewis, treasurer, and A. Hartuppe, John H. Roney and the officers named managers.

OHIO.

A fire at the Mingo Furnaces, owned by the Junction Iron Company, near Steubenville, on September 26, damaged the hoisting house to the extent of \$1000, the loss being covered by insurance.

A gentleman from Niles was interviewed last week regarding the alleged new co-operative rolling mill at that place, and said: "On the evening of September 22, a number of workmen met in the Amalgamated Association of Iron and Steel Workers' Hall, in Niles, and had a consultation with George Summers, the manager and operator of the Russia Mill. It is not a co-operative arrangement, as was reported. He showed us the lease and all the necessary documents, and said he was arranging for a speedy resumption of work. Three more furnaces will be added to the number already in the mill. Mr. Summers proposed to give back to every employee his old situation, and will give the men two weeks' pay after the mill has been running five weeks, and for the remaining three weeks' pay he will give a promissory note. The men like the arrangement and have accepted the proposition."

The Stove Molders' Union held a protracted meeting, in Cincinnati, on September 25, which resulted in an agreement to return to work immediately. The strike has been in existence for nearly a year.

The East Liverpool Glass Works have been bought by the Masonic Bank, of Pittsburgh. The amount paid for them was \$15,780. Two years ago the works cost \$60,000, and are now estimated to be worth that amount. The bank held a claim against the works, and for that reason bought them at the assignee's sale. It is not the intention to put them in operation, but to offer them for sale. The works are new, and are in a condition to start at once.

Extensive improvements will be made during the present idleness at Girard Furnace. The stack will be raised 10 feet and relined, and a new hot blast put in. A new battery of boilers will be added, and it is expected the furnace will not be ready to put in blast before December 1.

Anna Furnace, at Struthers, owned by Brown, Bonnell & Co., which was banked a year ago, is cold, and must be shoveled out before it can blow again.

The puddling mill and guide departments of the Forest City Rolling Mill, Cleveland, have resumed operations after several months of idleness.

Parties are talking of leasing Sarah Furnace, at Ironton, now idle, and making in it a soft fluid iron from Kentucky and native ores.

Ashtabula will start a \$100,000 nail mill, to employ 100 hands.—*Iron Trade Review*.

The works of the Lane & Woodworth Glass Roofing Company, Youngstown, which have been idle for some time, will probably be started up shortly.

The Boulton Carbon Company, of Cleveland, have recently purchased the whole carbon plant, stock and good-will of the United States Electric Lighting Company, of New York, and will transfer the same to Cleveland. To accommodate this addition to its business and to meet the growing demand for its superior carbons, the Boulton Company are erecting new buildings, which, when completed, will make this the largest carbon factory in the world. The dimensions of the buildings are as follows: One

building, two stories high, 360 feet long by 50 wide; another, 250 feet long by 50 wide, and a third, one story high, 170 feet long by 45 feet wide. These buildings all run parallel, and the power is derived from a 250-horse-power Buckeye engine. It is expected that the whole factory will be in full operation by the 1st of November. This gives them a capacity of 100,000 carbons per day.—*Iron Trade Review*.

WISCONSIN.

The iron ore at Black River Falls has been tested for Pittsburgh capitalists interested in the establishment of a smelting furnace at that point. The yield of the richest of the samples was 64 per cent. Of the \$160,000 required to start a furnace, \$120,000 have been subscribed.—*Wood and Iron*.

IOWA.

The first rolling mill in Iowa will be started at Burlington in October by the Burlington Rolling Mill Company. The mill will produce all sizes of merchant bar iron from scrap iron.

ILLINOIS.

The addition to the L. Wolff Manufacturing Company's works, Chicago, is now completed. The structure is 75 x 150 feet in size and four stories high, with a basement. It is of brick, and substantial throughout. The whole of the basement and first and second floors will be used as store and show rooms. The foundry has also been enlarged to double its former size, a new cupola of 25 tons daily smelting capacity being about completed. This cupola is 7 feet in diameter and 36 feet high. The foundry is now 75 x 150 feet in dimensions. The brass-finishing shop, which is on the third floor, is 150 x 150 feet in size. The marble shop, on the second floor, occupies a space 75 x 150 feet. In the new works the 200-horse-power Reynolds-Corliss engine which supplied power to the Railway Exposition in this city is in place. The equipment has also been further increased by two 150-horse-power Fierman boilers. The entire works cover an area of 150 x 224 feet in extent.—*Industrial World*.

What is said to be the greatest feat of unloading ever performed in this or any other country has been accomplished on the docks of North Chicago Rolling Mill Company, at South Chicago. Work was begun at 6 o'clock a. m. on the steamer Massachusetts, and at 12 o'clock precisely her cargo of 1618 gross tons Ludington ore was all on the dock. After an intermission of half an hour for dinner, the same gang went into the steamship Merrimac, and at 7 p. m. her cargo of 1581 gross tons Cleveland ore was all out, and she was ready for her return trip. Allowing half an hour intermission for supper, each boat was unloaded in six hours, making a total of 3199 gross tons in 12 hours. This gives an average of 266 1/2 tons per hour.—*Industrial World*.

Cribben & Sexton, of Chicago, are still running their foundry with non-union molders. As the latter continue to be annoyed and frequently attacked by the union men, they continue to go armed, and are still compelled to go to and from their work in squads. They receive a certain amount of protection from the city police, but probably more from Pinkerton's specials.

The Mitchell Foundry, in East St. Louis, was burned last week. The building was a frame structure, 50 x 80 feet. The total loss was placed at about \$4000, about \$2700 of which was covered by insurance.

Durkee & Keffer, of Chicago, are building two Harrington rotary engines for the Van De Poole Electric Light Company, to be used for running locomotive headlights.

MICHIGAN.

W. S. Armitage, long connected with the Eureka Iron and Steel Works, has severed his connection with them, and proposes to engage in other business. J. S. Van Alstyne, who has hitherto been at the works at Wyandotte, will take Mr. Armitage's place in the Detroit office.

Since going into blast a fortnight ago, Vulcan Furnace, at Newberry, is achieving a larger daily product, and at a less average operating expense, than ever before. The charcoal retorts started up on September 20, and the furnace is soon to be lighted by electricity.—*Marquette Mining Journal*.

MISSOURI.

The Chalmers-Spence Company, of New York, are covering all the steam and heating pipes in the St. Louis Custom House with asbestos, hair felt and canvas. The contract, which is one of the largest ever made in the latter city, is to cover 5000 square feet.

The Wrought Iron Range Company, of St. Louis, will soon begin the manufacture of a steel and malleable-iron range. Every part of the range exposed to the action of severe heat, including the oven, will be made of steel. The frame, tops, linings, oven doors, ash-pan, &c., will be malleable iron. The company are now arranging with the St. Louis Stamping Company for the necessary supplies of rolled-steel plates, plates to gauge from 12 to 20. The same advantages are claimed for the steel range that are advanced on behalf of the steel steam boiler. The company contemplate enlarging their capacity fully 100 per cent. this fall. The improvements will consist of the addition of two more floors to the present establishment, making it four stories high, and the building of a large warehouse.—*Age of Steel*.

The Duggan-Parker Hardware Manufacturing Company, of St. Louis, are about to add to their list of manufactures wrought-iron fire-irons.

The Shickle, Harrison & Howard Iron Company are running at only part of their capacity, melting about 100 tons a day.

ALABAMA.

The Ellerton Land Company, of Birmingham, will erect a machine shop and foundry for the manufacture of machinery and castings.

John F. Wheelless, of Nashville, Tenn., is president of a company which will erect a number of coke ovens at Warrior Station.

VIRGINIA.

A large foundry is to be erected at New River by Diuguid & Son.

ARKANSAS.

A company to known as the Texarkana Foundry and Machine Works has been incorporated at that place, with a capital of \$500,000.

TENNESSEE.

A stove foundry is about to be started at Milan by S. P. Taylor and Jesse Armstrong.

It is stated that a local company has been organized to purchase the Hazelhurst interest in the Lookout Rolling Mill, at Chattanooga, which will carry with it a controlling interest. If the purchase is made the mill will at once be put in operation.

NORTH CAROLINA.

The Marshall Foundry Company have completed a machine shop and foundry at Hickory.

TEXAS.

A large foundry and machine shop will be erected at Greenville for the manufacture of iron and castings.

Mr. C. Banks is putting up an iron foundry at Brenham.

CALIFORNIA.

A vessel recently arrived at San Francisco, from Germany, with 600 tons of scrap iron for the Oakland Nail Works.

OBITUARY.

ISAAC NEWTON.

On the 25th ultimo Isaac Newton, chief engineer of the Croton Water Department, New York, committed suicide by cutting his throat. He had been suffering greatly from ill health, aggravated by close attention to business and financial troubles affecting his father's estate. For weeks he had been the victim of insomnia, and his mental balance at last gave way. Engineer Newton was about 46 years of age and was born in this city. He was a son of Isaac Newton, who was one of the first men to own river steamboats, and who was associated with Commodore Vanderbilt. He was graduated at the New York University and began his profession as an engineer in the Delamater Iron Works. Subsequently he became associated with Ericsson and aided him in the construction of the ironclad Monitor. He was the first man who ventured aboard of that vessel. He accompanied the Monitor to Hampton Roads as an officer, and he superintended the engine during the memorable fight with the Merrimac. He was also second assistant inspector of vessels for the United States Government. During the war he had charge of the bureau of ironclads, and when he resigned from the navy Congress gave him a vote of thanks. He then became associated with General McClellan as first assistant engineer in the construction of docks in this city. In March, 1881, Commissioner Thompson appointed him as chief engineer of the Croton Aqueduct in the Department of Public Works. He was a member of the Society of Civil Engineers, the American Society of Mechanical Engineers and other organizations. The plans and specifications of the proposed new aqueduct were conceived and prepared by him. His ability as a civil engineer has been widely recognized, and he has written many works on the subject.

Fire on a Great Railroad Bridge.

On the 25th ult. half a mile of the great Lake Pontchartrain Bridge, in Louisiana, was destroyed by fire. This bridge forms part of the line of the northeastern branch of the Erlanger Syndicate. Fortunately for the company, a large number of creosoted piles are on hand at Slidell, on Bayou Bonfouca. The creosoted works of the company at Slidell, which for some time past have been idle, will be reopened at once, and it will not be long before the damage is repaired. The company have a full force of experienced bridge builders in their employ. The trestle of which the burned portion formed a part was 28 miles long. It was a magnificent piece of work, and was built entirely of creosoted timber. There were two draws in the bridge across the lake, which was 6 miles long. One draw was near the southern and the other near the northern beach, and it was between these draws that the fire proved so destructive. This is the deepest grade of the lake, and some piles 75 to 80 feet long are required. The bridge is the longest of its kind in the world, and cost \$1,250,000. It was built by contract by Fletcher, Weisenberg & Co., of Cincinnati. It was commenced in March, 1882, and finished in November, 1883.

Iron Ore From Cuba.

An item in the Philadelphia Record of September 25 says that the English steamship North Cambria was discharging at the old Navy Yard piers a cargo of iron ore from the mines of the Juragua Iron Company. A fleet of steamers has been chartered on time service. The fleet includes the following powerful English steamships, built for large carrying capacity as well as for speed: North Cambria, South Cambria, North Anglia and Primrose, each of which will carry 3000 tons.

A case in which the expansion of steel by heat caused considerable damage is reported from England. The rails on the new Midland line between Irchester and Sharnbrook, which has recently been opened for goods traffic, were laid during winter time, and insufficient room was left for expansion; consequently, the summer heat lately expanded the rails to such an extent that the road burst out of line. Traffic had to be at once stopped, and the permanent way altered and properly spaced.

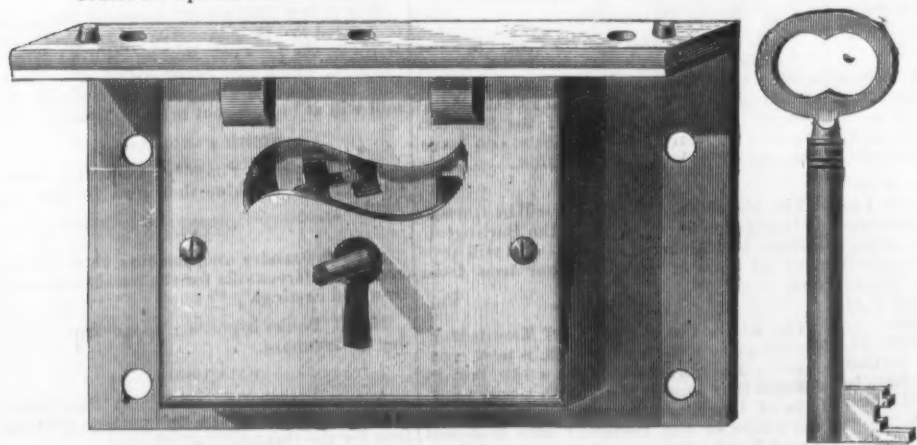
The works of Darwin are not allowed to be issued from the circulating libraries of Russia, and a recent Imperial decree puts those of Agassiz, Huxley, Lubbock, Adam Smith, Lewis and Spencer on the same list. The new list is not confined to English and American authors, for Moleschott, Büchner, Vogt, Reclus and others are considered unsuitable for Russian readers.

EAGLE LOCK CO.

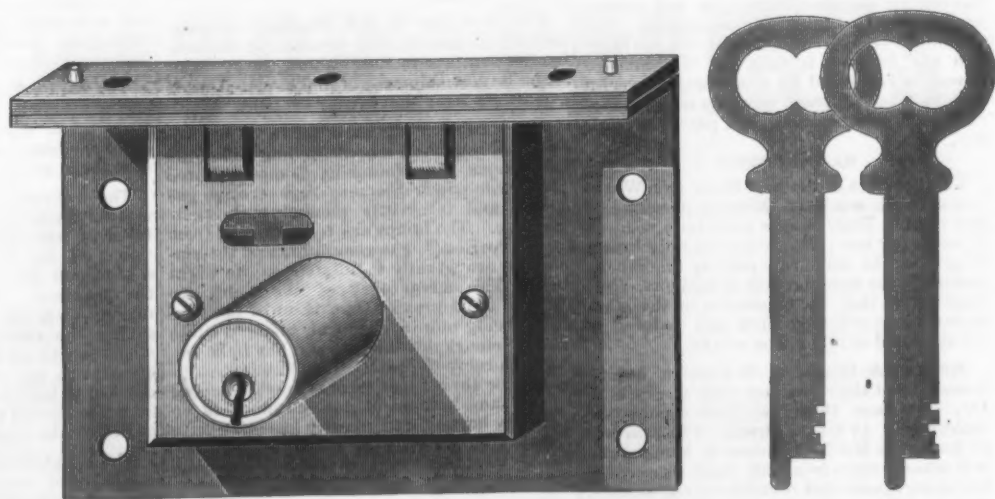
Manufactories at Terryville, Conn., and Geneva, Ohio.

Salesroom at No. 98 Chambers St., New York, U. S. A.

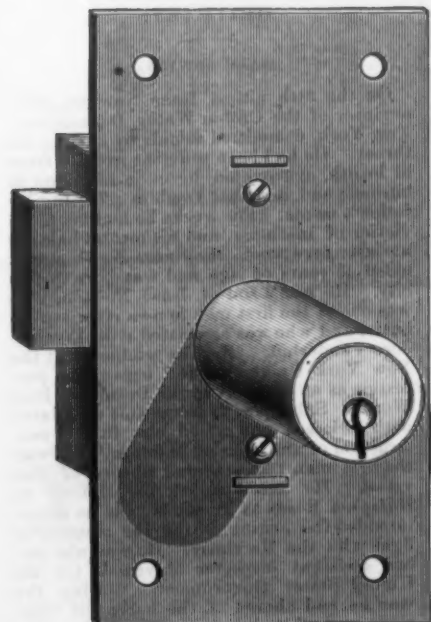
Orders for Special Die and Press Work and Small Brass Castings solicited at our Geneva Works.



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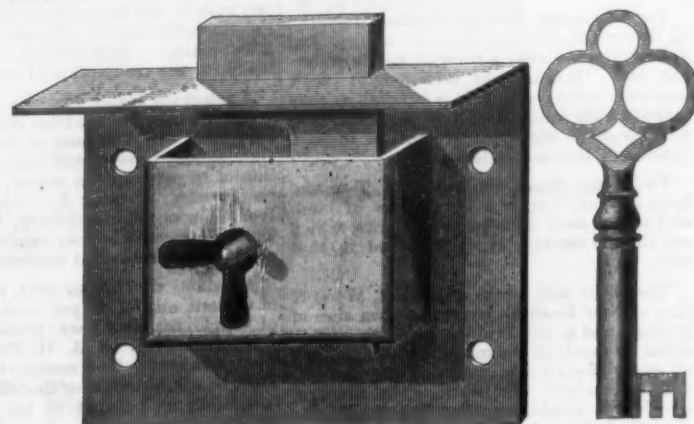
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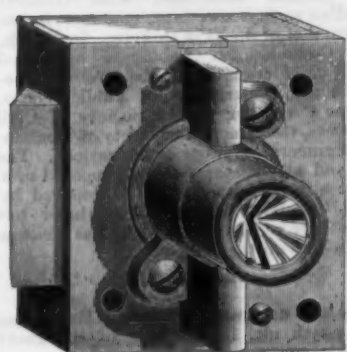
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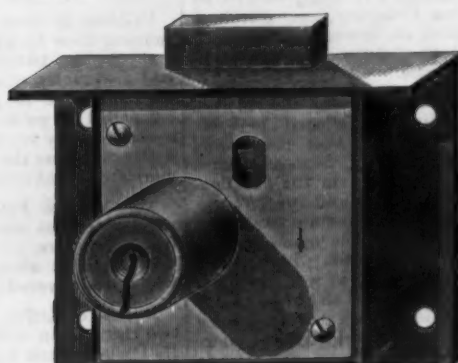
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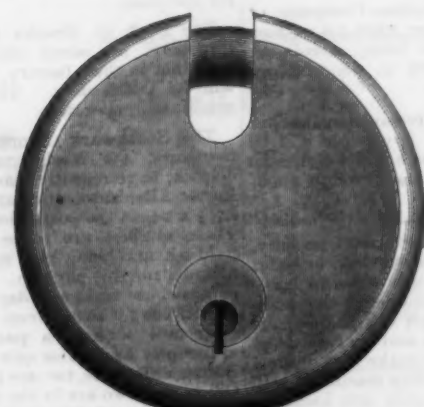
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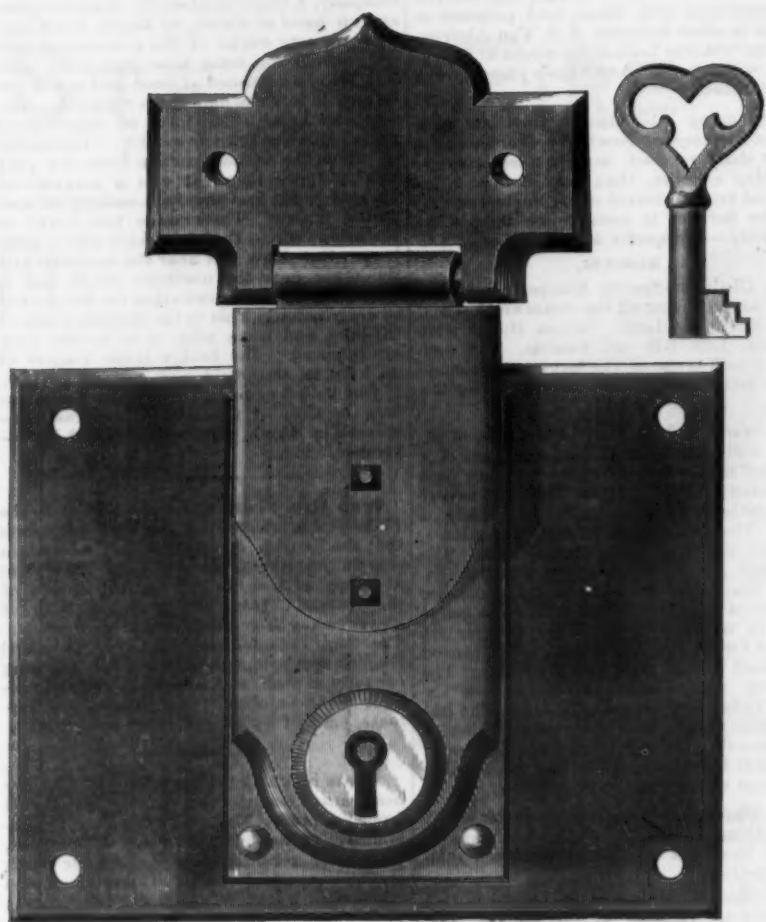
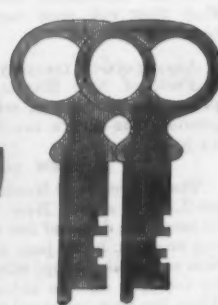
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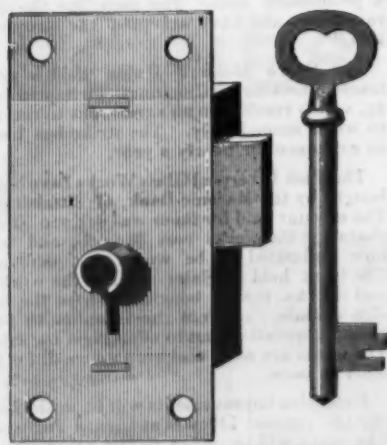
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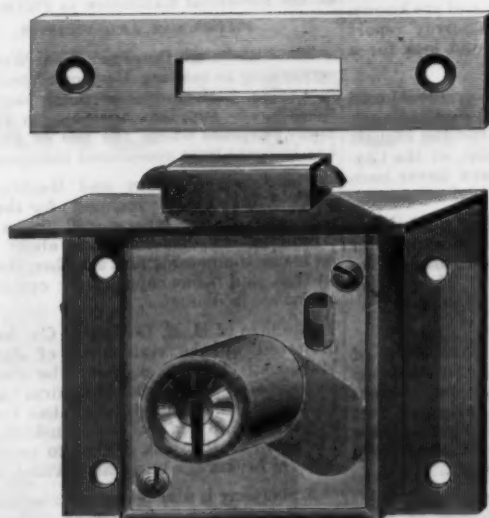
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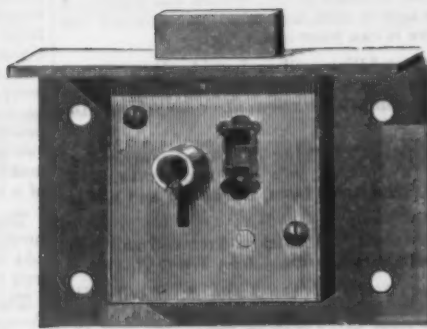
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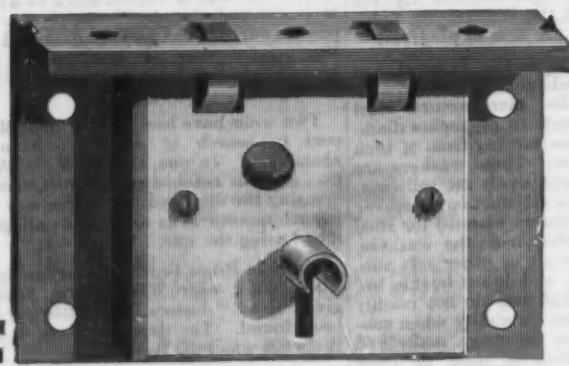
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ILLUSTRATED CATALOGUE MAILED TO THE TRADE FREE UPON APPLICATION.

At the Cincinnati Exposition.

We have received from our special correspondent at Cincinnati the following notes of some of the exhibits made at the Industrial Exposition now being held in that city:

Hoovens, Owens & Rentschler, of Hamilton, Ohio, display a monster 140-horse-power Hamilton-Corliss engine. This engine is used to furnish power for Machinery Hall. Next in order is the exhibit of the Long & Allstatter Company, of the same city, consisting of power punches, shears and hammers. The Gordon & Maxwell Manufacturing Company, also of Hamilton, have in operation a model water-works pumping engine with a capacity of 500,000 gallons per day, also a number of smaller engines of the same pattern.

The Niles Tool Works have an exhibit of radial drills, lathes, &c., for heavy and light work.

The Lane & Bodley Company, of Cincinnati, make a good display of shafting, hangers, couplings and all appliances for transmission of power.

Bental, Margedant & Co., of Hamilton, Ohio, have an extensive exhibit of wood-working machinery, as do also J. A. Fay & Co., of Cincinnati, who have the largest group of machinery in the hall. Post & Co., of Cincinnati, display a full line of iron-working machinery, consisting of lathes, drills, planers, &c.

The Lechner Manufacturing Company, of Columbus, have in motion their patent roller detachable chain belting.

McFarlan & Nottingham, of Cincinnati, show an improved quick-return, upright drill in motion.

Geo. A. Gray, Jr., & Co., show several of their iron planers and improved lathes.

The Universal Radial Drill Company, of Cincinnati, display four of their large "Universal" and "Radial" drills, together with a new pattern of the "Universal" of smaller size.

The Cincinnati Screw and Tap Company make a very fine display of machine screws and taps of all sizes.

The Lane & Bodley Machine Company's Exhibit No. 2 consists of gang edgers, fractional head blocks, quick-opening lever valves, saw guides and a mammoth saw mill, together with a 125-horse-power, high-speed, center-crank and automatic-cut-off slide-valve engine.

Smith, Myers & Schnier, of Cincinnati, exhibit a running engine of their patent terrapin center-crank, stationary pattern, 140-horse-power.

Bradley & Co., of Syracuse, N. Y., exhibit several of Butterfield's patent rubber-cushioned helve hammers.

Krieger, Burkhardt & Co., of Cincinnati, invite the attention of steam users to Turner's compound slide-valve engine with variable cut-off.

M. C. Henley, of Richmond, Ind., makes a fine display of gold and nickel plated "Challenge" roller skates, both rink and club, together with a complete line of skaters' outfits.

The Attwell Manufacturing Company, of Cincinnati, have a very pretty model of a cottage erected, showing the application of the Attwell burglar-proof sash lock and ventilator.

Hoff, Noll & Renner have in operation one of their new patent roofing seamers, also a very ingenious machine for manufacturing coal hods out of one piece of sheet iron.

The Wayne Hardware Company, of Cincinnati, make an excellent display in the main hall of a general line of builders' hardware, cutlery, tools, &c.

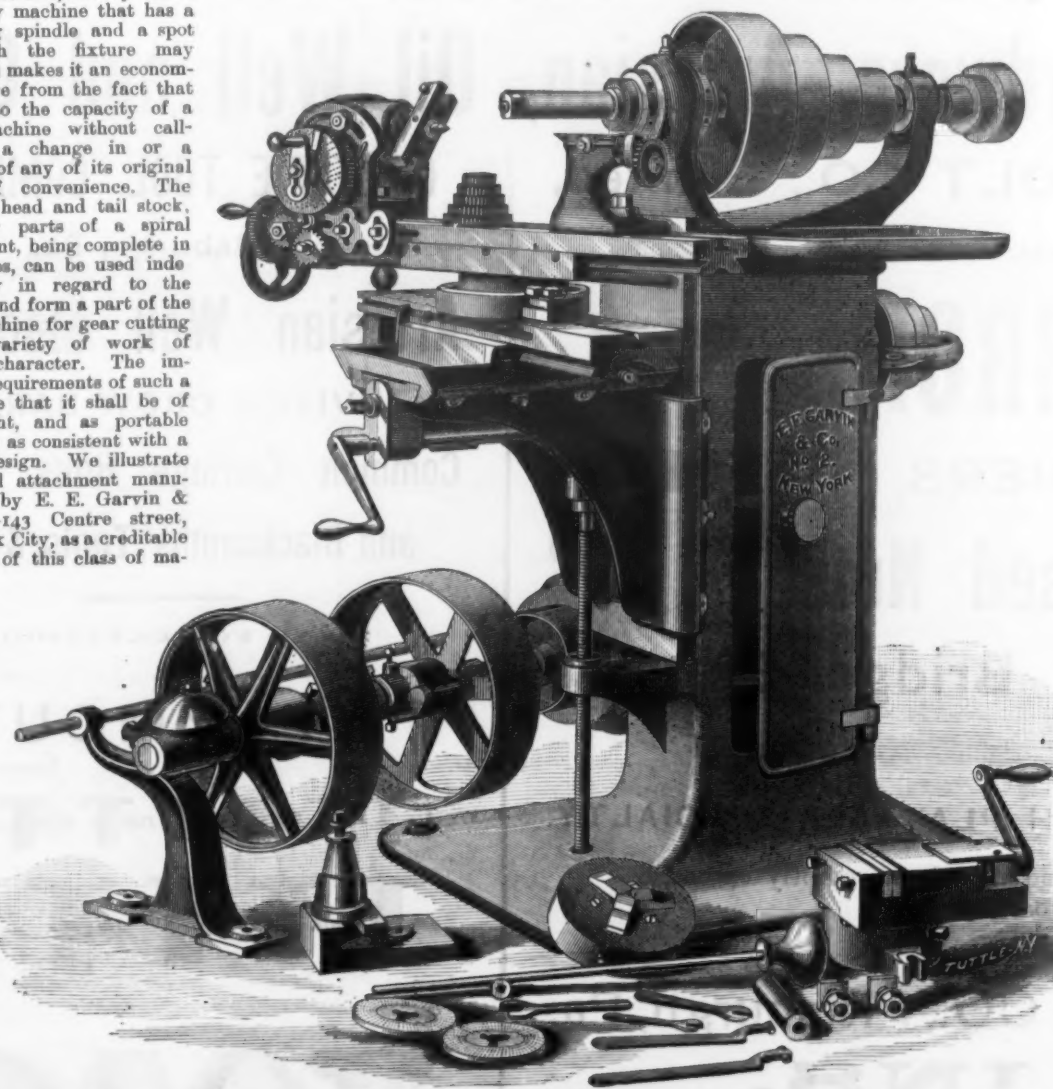
The Invention of Matches.—According to a German paper, the inventor of lucifer matches was a political prisoner who perfected his idea in 1833, within the walls of a State prison. Kammerer was a native of Ludwigsburg, and when sentenced to six months' imprisonment at Hohenasperg he was fortunate enough to attract the notice and to gain the favor of an old officer in charge of the prison, who, finding he was studying chemistry, allowed him to arrange a small laboratory in his cell. Kammerer had been engaged in researches with a view of improving the defective steeping system, according to which splinters of wood, with sulphur at the ends, were dipped into a chemical fluid in order to produce a flame. If the fluid was fresh the result was satisfactory, but, as it lost its virtues after a time, there was no general disposition to discontinue the old-fashioned system of using flint and steel. After many failures Kammerer began to experiment with phosphorus, and had almost completed his term of imprisonment when he discovered the right mixture and kindled a match by rubbing it against the walls of his cell. On coming out of prison he commenced the manufacture of matches. Unfortunately, the absence of a patent law prevented his rights from being secured, and, on Austrian and other chemists analyzing the composition, imitations speedily made their appearance. In 1835 the German States prohibited the use of these matches, considering them dangerous. When they were made in England and sent to the Continent these regulations were withdrawn, but too late to be of any benefit to the inventor, who died in the mad house of his native town in 1857.

A Negro Industrial Exhibit.—A feature of the New Orleans Exposition will be a display of specimens of the handwork of negroes. A number of their leaders in various sections of the country are actively at work arousing interest in the project and securing cooperation. Rev. E. F. Tanner, editor of the *African Methodist Review*, who has been appointed commissioner for Pennsylvania, says: "The colored people of this State will doubtless make a very creditable showing at the New Orleans Exposition. In this State we have numbers of young men engaged in industrial pursuits, and many have already expressed their readiness to exhibit their handwork. Though there have been a number of industrial exhibitions held among our people, this is the first time that an opportunity has been given to the race to show to the world what they can do. In a few days 8000 circulars will be sent throughout the State, and especially to points where the colored people are most progressive

from an industrial point of view. In Philadelphia we have an electrolyzer, gold refiners, upholsterers, cabinet-makers, draftsmen and quite a number of artists. There is to be appointed an assistant commissioner in each Congressional district, so that the State will be completely covered."

Spiral Attachment for Milling Machines.

There exist a number of advantages in a separate and self-contained fixture for cutting spirals upon the universal milling machine. Its adaptability to almost any machine that has a revolving spindle and a spot to which the fixture may be bolted makes it an economical device from the fact that it adds to the capacity of a plain machine without calling for a change in or a sacrifice of any of its original points of convenience. The dividing head and tail stock, necessary parts of a spiral attachment, being complete in themselves, can be used independently in regard to the fixture, and form a part of the plain machine for gear cutting and a variety of work of similar character. The important requirements of such a device are that it shall be of little height, and as portable and light as consistent with a durable design. We illustrate the spiral attachment manufactured by E. E. Garvin & Co., 139-143 Centre street, New York City, as a creditable specimen of this class of ma-



SPIRAL ATTACHMENT FOR MILLING MACHINES.—E. E. GARVIN & CO., NEW YORK.

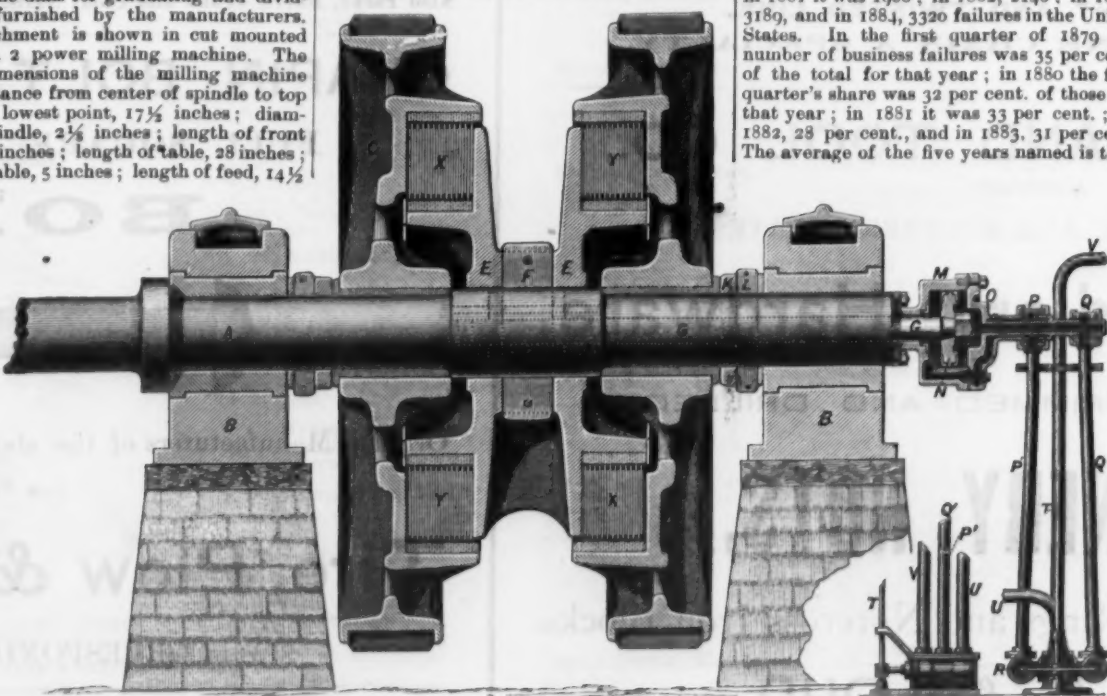
chinery. The fixture will swing 10 inches, and take in a length between centers of 12 inches. With the nine change gears furnished, one turn in right and left hand spirals from 1.66 inches to one turn in 5 feet can be cut. The attachment is made from entirely new patterns modified and improved upon the strength of reports and observations in its practical use. A printed table for the arrangement of the gearing for spiral cutting, and another for handling the dials for graduating and dividing, are furnished by the manufacturers. This attachment is shown in cut mounted upon a No. 2 power milling machine. The general dimensions of the milling machine are: Distance from center of spindle to top of table at lowest point, 17½ inches; diameter of spindle, 2½ inches; length of front bearing, 4 inches; length of table, 28 inches; width of table, 5 inches; length of feed, 14½

inches; adjustment to and from column, 6 inches; counter-shaft has friction clutch pulleys. Weight of machine and attachment, 1250 pounds.

The Ironclad Furnace Suit.—From Stenbenville, Ohio, we have the following particulars: The Ironclad Furnace and rolling-mill property at Ironclad, this county, were bid off at public sale in December, 1881, by Henry M. Long, trustee. John McNab, of New York, had a decree for \$3000 or \$4000 upon the property, which was a first lien. Long paid no purchase money, and, to have the sale confirmed and deed made to him, a plan was devised to create a trust and the lien in judgment satisfied. McNab's attorneys withdrew their claim for a first lien, and undertook to put it back of a mortgage executed by Long to W. H. Mooney, as trustee for Pittsburgh parties for \$25,000, the intention being that Long was to sell the property within one year, and pay off the mortgage, the McNab claim and other claims in trust. The sale was not made, and the Pittsburgh parties brought

Clutches for Heavy Work.

In the accompanying engraving we show a sectional view of a large Weston clutch, as designed by the Yale & Towne Manufacturing Company, of Stamford, Conn., for reversing the gearing of the blooming train of a large rolling mill. These clutches were built several years since and have performed their work with entire success.



ONE-THOUSAND HORSE-POWER WESTON CLUTCH.—YALE & TOWNE MFG. CO., STAMFORD, CONN.

suit to foreclose the mortgage. McNab answered that his attorneys had no authority to postpone his lien to the mortgage, and asked that his decree be restored to the first lien. The case was tried and judgment rendered in favor of McNab. The Pittsburgh parties appealed to the district court, which has just rendered judgment in favor of Mr. McNab, giving him first lien for the amount of his claim and ordering the sale of the property. The original sale of the works was for \$34,667, two-thirds of its appraised value. It is now appraised at \$50,000. The works have been closed since the fall of 1875. When built the mill and

of the number of failures occurring each week, together with a number of the more important embarrassments in the business world. Gauged by the record of failures in trade circles since January 1, the total for 1884 promises to exceed the aggregate which was foreshadowed at the conclusion of the first quarter of the current year. In 1879, in the first quarter, the total was 2350, from which there was a drop to 1304 in 1880. From that on there has been a steady gain; in 1881 it was 1986; in 1882, 2146; in 1883, 3189, and in 1884, 3320 failures in the United States. In the first quarter of 1879 the number of business failures was 35 per cent. of the total for that year; in 1880 the first quarter's share was 32 per cent. of those for that year; in 1881 it was 33 per cent.; in 1882, 28 per cent., and in 1883, 31 per cent. The average of the five years named is thus

end of the latter is the hydraulic cylinder M, and within this the piston N on the end of the rod G. The water pressure, from an accumulator, is controlled by the handle T, and forces the piston to the right or left, as desired, thus controlling the ponderous clutches, some 10 feet in diameter, as easily as the air brakes of a locomotive.

Nine Months' Failures.

The near approach of the end of the third quarter of the current year, says *Bradstreet's*, renders possible an interesting examination

ive total for 1884 (as between April 5 and to-day) is due to the striking increase of some 52 failures weekly, on the average, during the months of July, August and September, as compared with the record for those months in 1883. In the first quarter of 1884 the excess of average failures was but eight failures weekly, and in the second quarter but four failures each week, as against the record for 1883. For the first nine months of the current year, to and including September 30, the indications are that the total number of failures in the United States will aggregate 8290, as compared with 7358 failures in a like portion of 1883.

No failures among those recorded have a more widespread or vital connection with the whole commercial community than those of banks and banking institutions. It is notorious that the failures of banks in 1884, State, national and private, have been considerably in excess of the rate in former years, particularly in 1883, when the aggregate of all failures was exceptionally heavy. The total number of classified bank failures, by months, for 1884, as compared with 1883, is as follows:

COMPARATIVE BANK FAILURES.									
	National.	State.	Savings.	Private.	Total.	1884.	'83.	1884.	'83.
Jan...	1	2	1	1	5	10	3		
Feb...	2	1	...	...	4	5	2		
March...	1	...	...	...	3	4	2		
April...	2	...	...	...	6	2	4		
May...	5	...	...	...	25	1	42		
June...	...	...	...	...	10	12	1		
July...	1	...	...	...	10	17	3		
Aug...	4	...	...	...	4	8	9		
Sept...	2	...	...	...	3	2	9		
Total...	14	6	19	1	13	2	71	10	117

The number of bank failures in the United States in the past nine months is four times as large as those in a like period in 1883. There have been twice as many failures of national banks, five times as many of savings institutions, and more than three and one-half times as many private bank failures. Of the whole, about 60 per cent. have been private banks, as compared with 66 per cent. last year; about 10 per cent. savings banks, as compared with about 8 per cent. last year, and about 10 per cent. national banks, as against 20 per cent. last year. The heavy proportionate gain in mortality has been among incorporated State banks. The increase in private bank failures of 43 is large, in part due to speculation, many of the class denominated private bankers being of the "banker and broker" variety.

Out of the total of 14 national bank embarrassments since January 1, one-half, or 7, only were due to criminal carelessness and to fraudulent handling of the funds. In the case of 5 others want of judgment in investing the banks' funds is found to be at the root of the suspensions. One suspension was caused by a run. Out of 117 bank failures in 38 weeks, 16 only are found to be due to frauds and to embezzlement—7 of national, 5 of State and 4 of private banking institutions. In the whole of 1883, out of 8 national bank failures, but 2 were due to frauds and embezzlement, 4 private bank failures being attributable to the same causes, also that of 1 savings bank. With a gross number of bank failures for 38 weeks 2.6 times larger than for 12 months of 1883, we find the total of corrupt failures but 16, as against 7. Surely this record does not merit the scandalous language used by flippant writers on the subject, who discuss the wholesale thievery of American bank officials.

Another Large Iron-Ore Dock on Lake Superior.—On the 24th ult. sealed proposals were opened at the general offices of the Milwaukee, Lake Shore and Western Railway Company, in Milwaukee, for the construction of the company's ore dock at Ashland, Lake Superior. The work will be one of great magnitude, the estimated cost of the dock being in the neighborhood of \$600,000. The plans and specifications of the structure show that it will not only be the largest on the lakes, but perhaps the largest ore dock in the world. Its extreme length over all will be 1400 feet, and it will be 46 feet wide and 40 feet high. There will be 234 pockets, with a capacity of 25,000 tons of ore; two train loads of ore can be dumped at the same time, and the largest vessels can be loaded in from six to eight hours. The superstructure will rest upon 7000 piles, forming a dock basin which will be filled solid from the bottom of the harbor to 19 inches above high-water mark. The dock will draw 20 feet of water, so that the largest vessel afloat upon the lakes can be loaded. The work of construction will be under the immediate charge of Superintendent L. S. Barr, and will continue through the winter, and employment will be given to a large force of men. This dock will afford shipping facilities for iron ore from the newly developed Lake Agogebic range, which is totally distinct from both the Marquette and Menominee ranges.

Boiler-makers' and Shipbuilders' Convention.—The fourth annual convention of the Boiler-makers' and Iron Shipbuilders' Association was held in this city last week. Fifty delegates, representing over 4000 members, were in attendance. The principal subjects under discussion were the protection of the shipbuilding interests of the country and a uniform scale of working hours. The old and present rule is nine hours on old work—that is, repairs—and 10 hours on new. It is proposed to reduce all to nine hours. The request for the new arrangement will be distributed to all the lodges of the association in the United States and Canada, and the demand will be made, and it is thought granted, in January. Resolutions were also passed deprecating legislation in free ships. Thomas J. Curran, of New York, was elected president for the ensuing year; Charles Allen, of Fort Howard, Wis., was elected vice-president; Thomas Cox, of Minneapolis, Minn., treasurer, and James McGivren, of Cleveland, Ohio, secretary.

The machinery, tools and office furniture of the American Heating and Power Company were sold on the 26th ult. at auction at the company's offices, 33 Gold street, New York. The company have been in the hands of the receiver, R. L. Edwards, of the Bank of the State of New York, and their realty was sold some time ago. The proceeds of the recent sale were about \$7000.

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Formerly LOVEJOY & DRAKE,

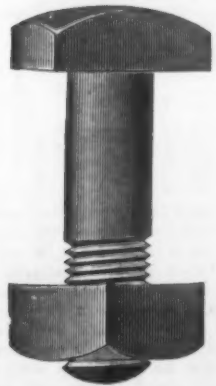
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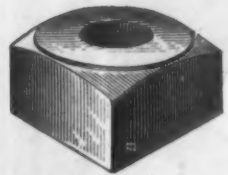
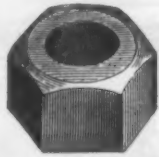


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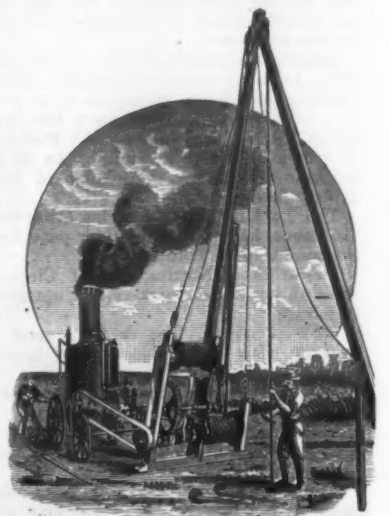
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VICES, CROW BARS,

Common Carriage Bolts, Sledges

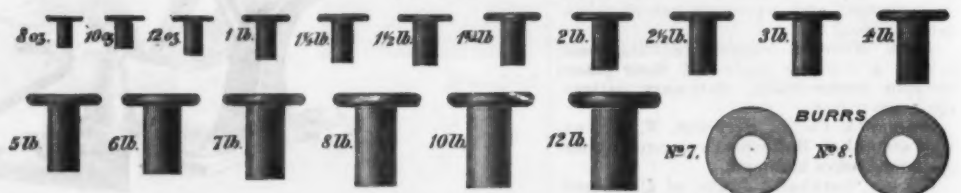
and Blacksmiths' Tools, &c., &c.

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[ESTABLISHED 1830.]



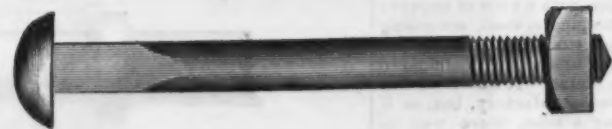
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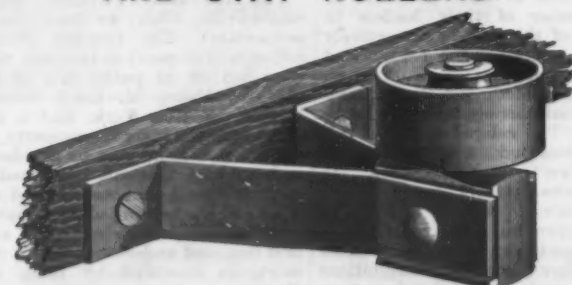
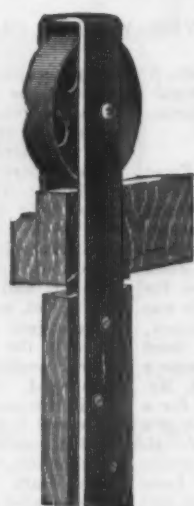
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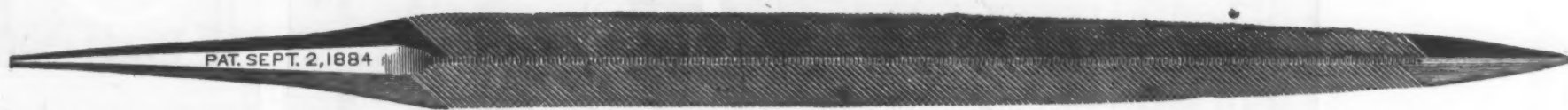
NEW AMERICAN FILE CO., PAWTUCKET, R. I.

MANUFACTURERS OF

FILES AND RASPS.



CUT BY OLD METHOD.



PATENT IMPROVED CUT.

To all whom it may concern:

There has been just cause for complaint at the edges of the Three-Square Files breaking down. Every manufactory in the country makes Three-Square Files by the same method, and every user of the Three-Square File is aware that their edges have always been defective. With these facts in view, we present to the public a Three-Square File whose edges are as strong as its sides.

The mode of manufacturing these PATENT Three-Square Files is very simple of itself; still, those who have used them will affirm that they will do twice, and some even four times, as much work as any Three-Squares they ever used.

We do not claim that the superiority of this PATENT Three-Square is the result of any Hocus Pocus process, as any mechanic can see at a glance that from the mechanical construction of its edges it must of a necessity do more work than any file of its kind ever before offered to the public.

To the dealer this file will yield a handsome profit, and to the consumer One Hundred per cent. advance in price would not warrant buying any other file of its class. We warrant every file to do twice the work of any other Three-Square Saw File that can be produced, "either Foreign or Domestic." BEWARE OF IMITATIONS. Write for Sample Lot, Price and Terms.

April 21st, 1884.
The File was too small for the 9-inch circular saw, on which it was used "twice." The saw is hard and is severe on all Files, sometimes wearing out a (name withheld) 7-inch File at one sharpening. We return the File by mail.

WESTCOTT & THOMSON,
710 Filbert St., Philadelphia, Pa.

March 31st, 1884.
The Files are the best; the principle is right. When we are in need will send you an order.

W. T. BURGESS, Albany, N. Y.

May 6th, 1884.
The Files are the best; and the principle is right. The File cuts unusually smooth.

THE WALES WHEEL COMPANY,
Bridgeport, Conn.

July, 1884.
I think the File is the best, and the principle is just what is wanted, and will be a great saving to the consumer. E. A. WALKER, Ansonia, Conn.

June 10th, 1884.
I think your Files far ahead of anything in the market in the File line.

C. R. BECKER,
Albany, N. Y.

July 15th, 1884.
The Files are the best; principle is right. I find them to do equally as well on fine-tooth saws as on coarser.

W. A. BROWN, Waterbury, Conn.

June 23d, 1884.
The Files are the best; principle right. I like your Files. When can I get them?

J. E. SHAW, Bridgeport, Conn.

April 4th, 1884.
The Files are the best: the principle is right. They are the best File I have got for a number of years, for I have filed with them, and one corner is as good as a whole File. JAMES S. SIMPSON,
1021 Mount Holly st., Philadelphia.

April 15th, 1884.
The Files are the best. Would recommend them in preference to any other, if they are all like that one, which filed nine saws, and five of them were high-tempered saws. HARRISON W. SMITH,
Leviston, Me.

February 27th, 1884.
Files A 1. Good as I want. Shall use them in preference to any others.

C. H. ANNABLE,
Springfield, Mass.

January 7th, 1884.
The Files are the best. Have filed three saws with one edge of sample.

J. S. WHITE,
Pawtucket, R. I.

February 8th, 1884.
The Files are the best. Will last longer than any two I ever used.

EMERSON BABBITT,
Taunton, Mass.

March 4th, 1884.
The Files are the best. Would recommend them in preference to any other. I think they are better than the Stubbs files.

LITTLEFIELD STOVE CO., Albany, N. Y.

March 4th, 1884.
The Files are the best. Think the principle right. Have filed 16 saws with one, so that speaks for itself.

DEMPEY'S BLEACHERY,
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Best ever used. Will do twice to three times the usual work. SLATER COTTON COMPANY,
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Will file two to three times as many saws as ordinary files. Files 13 saws with 3/4-inch File.

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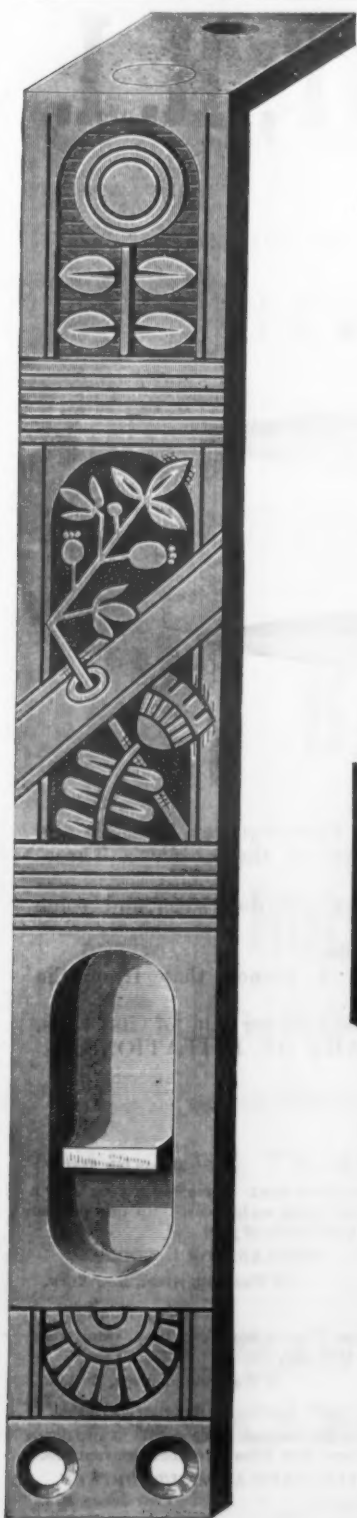
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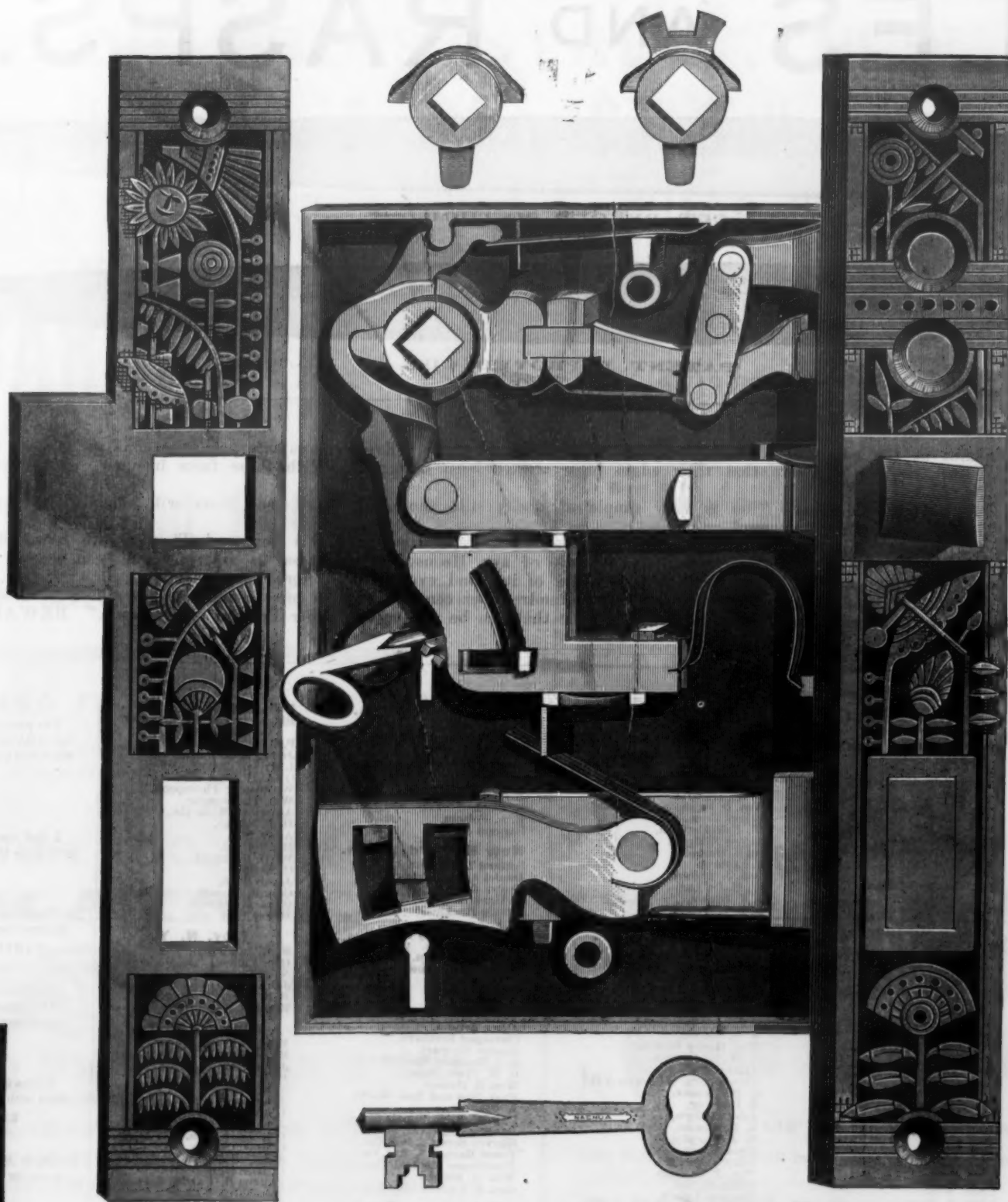
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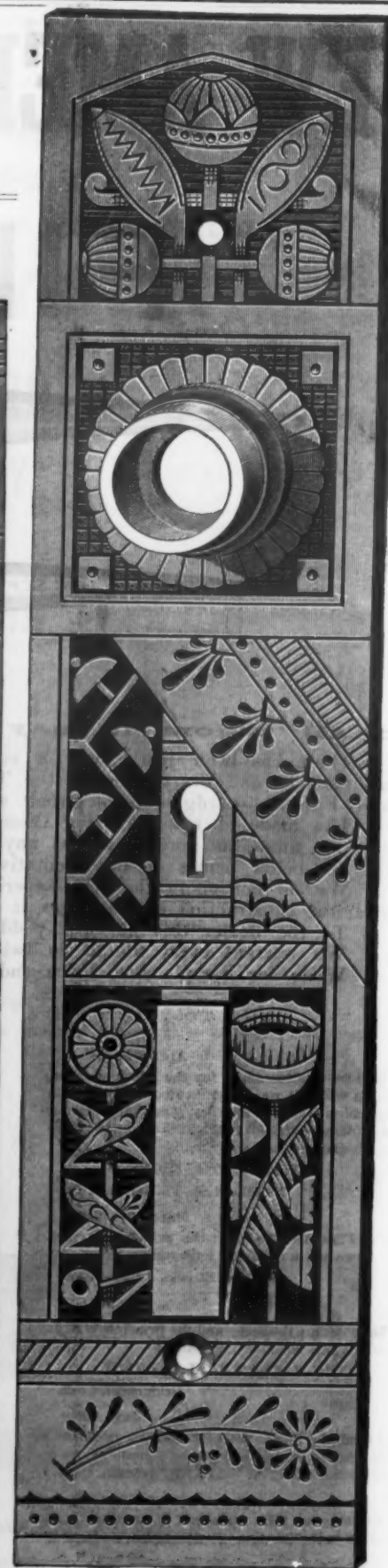
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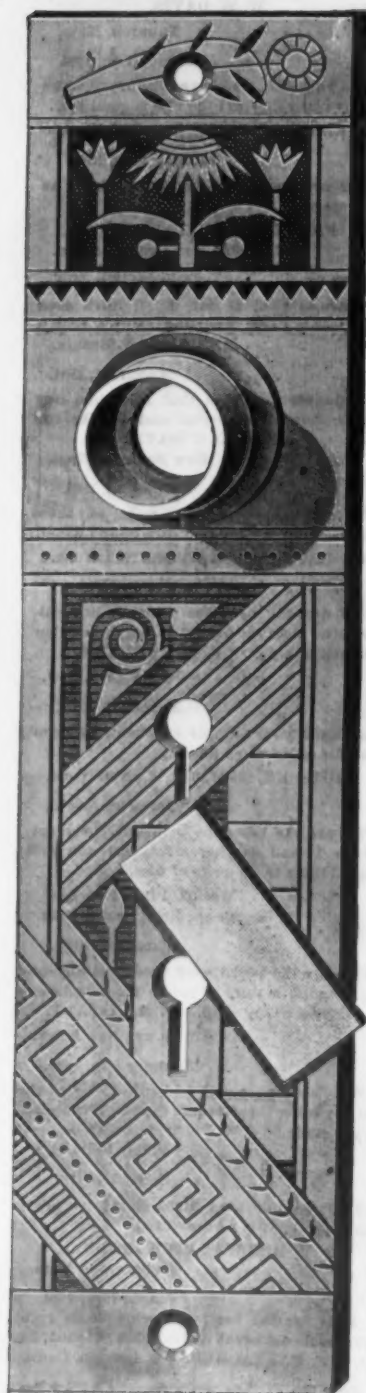
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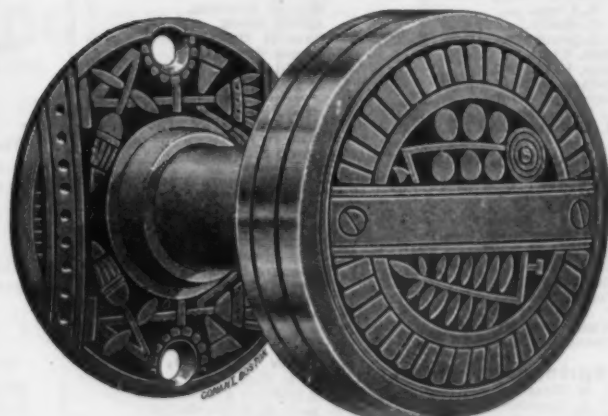
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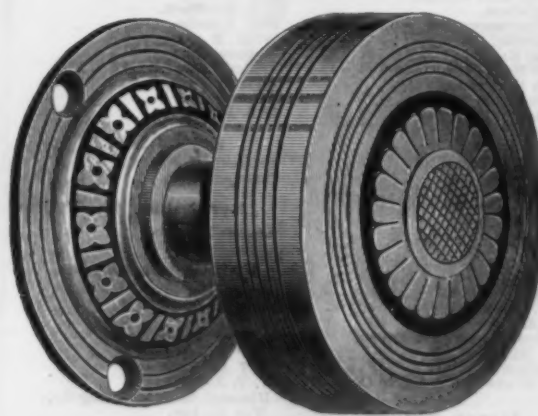
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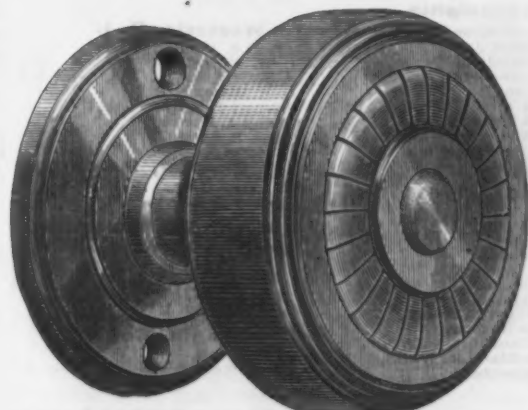
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The Value of a High Tariff.

Last March Mr. Frelinghuysen, Secretary of State, addressed a communication to the Senate Committee on Foreign Relations, containing a very significant paragraph. The subject of the communication, which has only lately been made public, was the advisability of the appointment of a commission to consider what the best interests of North and South America require, and to report upon the most feasible means of carrying out measures of mutual advantage, including, if necessary, the calling of a conference of the various countries of the Western Continent. Referring to commercial advantages which the United States should endeavor to secure from its neighbors, Mr. Frelinghuysen said: "The true plan, it seems to me, is to make a series of reciprocity treaties with the States of Central and South America, taking care that those manufactures, and as far as is practicable those products, which would come into competition with our own manufactures and products should not be admitted to the free list. By these treaties we might secure for valuable consideration, so as not to violate the 'most favored nation' clause of other treaties, further substantial advantages—such, for example, as the free navigation of their coasts, rivers and lakes."

This is the opportunity gained by our tariff. The people of the United States, now numbering over 55,000,000, constitute a very important market for almost anything produced in any quarter of the globe. Of such great value is free entry into this market regarded that many nations would be willing to confer special trade privileges to the citizens of the United States in exchange for such an opportunity. In negotiating commercial treaties with the countries of Central and South America there are peculiarly favorable conditions. They differ very greatly from ourselves in natural productions, for the most part offering only tropical products in exchange for our manufactures, breadstuffs and provisions. It would be to the mutual advantage of our neighbors and ourselves, therefore, to cultivate the closest

possible commercial relations. Continuing

the subject, Mr. Frelinghuysen said further:

"Indiscriminate reduction of duties on materials peculiarly the production of Central and South America would take from us the ability to offer reciprocity, and we would thus lose the opportunity to secure valuable trade. Removal of duties from coffee, without greatly cheapening its price, deprived us of the power to negotiate with the coffee-growing countries of Spanish America highly advantageous reciprocity treaties, and indiscriminate reduction of duties on sugar would complete our inability to establish favorable commercial relations with those countries which form our natural market, and from which we are now almost entirely excluded. If we confine the reduction of duties on such articles as sugar and coffee to those Spanish-American countries which are willing to negotiate with us treaties of reciprocity, we cheapen these products for our own people and at the same time gain the control of those markets for the products of our fields and factories."

In this paragraph the Secretary outlines very forcibly a use to which our tariff can very properly be put. A mere general reduction of duties by Congress, as he points out, does not benefit the consumer much by reducing prices, while it deprives us of the power of negotiating desirable treaties with other nations on the basis of a promised reduction specifically in their favor. The abolition of the duty on tea and coffee was at the time thought to be a very wise measure by protectionists, who favored the importation of these articles free of duty because they competed with no native products, but it is now confessed that a much wiser plan would have been to have made reciprocity treaties with Brazil, Venezuela and other countries, stipulating for free entry of our manufactured goods into their ports in consideration of our admission of their coffee and tea on the same footing. Diplomatic interference with the tariff question is resented by our House of Representatives, but Congress itself does not always legislate for the best interests of the nation, as was shown in its reckless waste of this great opportunity. The Senate, however, recognizes this fact, and is more ready than the House to endeavor to obtain commercial advantages through diplomacy. The Senate Committee on Foreign Relations last May, in a report on the tariff laws of the various countries of the world, said:

"In making any changes in tariff laws external conditions should be well examined, and domestic considerations should not entirely control the arrangement of the schedules. In cases where additions may safely be made to the free list, or duties can be reduced without disturbing any industries, it may be possible to secure reciprocal commercial favors from the countries whose products would then be admitted to our markets on more favorable terms."

In this respect our high tariff puts us on a much better footing than if we had a very low tariff. We have something of value to give away whenever the time comes. For some articles that time may not come for many years, while for others the time may now be at hand. France profits by such a condition of affairs, her artisans reaping constant advantage in countries maintaining conventions with the French, while Great Britain has given up all chance of benefit in this direction, and sees her trade waning with no hope of relief except in reducing wages still lower and making goods still cheaper in order to circumvent hostile tariffs."

Working of the Watertown Testing Machine.

We have long been proud of the existence of the United States Government testing machine at the Watertown Arsenal, which is beyond all comparison the best testing machine in the world. We may be proud of the machine itself, but we can scarcely be proud of the work accomplished by it during the past year, as shown in the bulky report of 670 pages, recently issued by the Government, a few abstracts of which are given elsewhere in this issue. Major Parker, commanding the Watertown Arsenal, himself does not seem to be proud of the work done by the machine, for in the preface to the report he makes some very just criticisms of the character of the tests upon which the machine has been employed. He says: "Considerable work has been done and time and money spent in testing small pieces of wood for the Census Bureau. These specimens, being but a few inches in dimensions, were of a size entirely within the capacity of almost any one of the numerous testing machines throughout the country. It is not supposed that it is possible or advisable to entirely exclude from this machine hand specimens of materials, but to occupy considerable time and to absorb much of the appropriation by expensive tests on small pieces would seem to divert the machine from most useful work, and to ignore one of the ultimate objects of its construction." It seems to us that this employment of the Watertown machine for making the tests for the Census Bureau, the report of which occupies more than half of the whole volume, is especially indefensible, since the Government itself has at its various navy yards and ordnance buildings quite a number of testing machines of from 40,000 to 100,000 pounds capacity, on which all of these tests might have been made at much less expense than they could have been made on the large machine.

The appropriation for the last fiscal year for the testing machine and its work was \$10,000, all of which, together with \$1604 left over from the preceding year, has been spent. The act for appropriating the funds for the year contained the following clause: "And the chief of ordnance shall give attention to such programme of tests as

"may be submitted by the American Society of Civil Engineers, and the record of such tests shall be furnished said society, to be by them published at their own expense." Major Parker's report says that in December, 1882 "the above society submitted to the chief of ordnance a programme which was in substance a recommendation that the tests for the year be limited to compression members of structures; that parties desiring such tests made should send them to this arsenal, and should furnish a history of their manufacture; that the Ordnance Department should pay the freight, test the specimens free of cost, return the scrap and make early report. No advantage has been taken of these facilities, for up to this time no specimens have been received in conformity with this programme." It will now be in order for the American Society of Civil Engineers to explain why no specimens have been received. We suppose that the reason is that the programme jointly agreed upon between the society and the chief of ordnance provided only for the testing of such materials as should be made at their own expense by private individuals who would be public-spirited enough to go to this expense for scientific purposes and for the benefit of the public at large. As no individual has yet appeared who is willing to pay out of his own pocket the several thousand dollars which would be required to pay for a complete suite of specimens of sufficient size for the Watertown testing machine, and in such number that they should give results of importance, the programme of the American Society of Civil Engineers is likely to remain a dead letter. Major Parker, in the preface to his report, furthermore says: "Tests have been made during the year on a variety of subjects of more or less interest. The testing of riveted joints and of wrought-iron laced and boxed columns have been continued from previous years, and information on these subjects is thought to be desired by engineers and builders." The result of all the tests that have been made during the past year appears at present to be merely a Government volume of 670 pages.

It will be a labor of love some day for an engineer who wishes to write a book on the strength of materials to wade through this publication and try to find in it the results that will be of permanent value to engineers. The results are in the volume, we have no doubt, and it is necessary, of course, in a Government publication that every figure and fact obtained by the experiments of the machine should be carefully recorded, no matter how great the expense for time and for printers' ink; but it seems to us that the results might have been abridged in the shape of summaries, and the deductions might have been made from them by the parties in charge of the experiments, which would have been of immediate value to engineers. Major Parker says that "the tests and reports have been made and the machine arranged by Mr. Jos. E. Howard, C. E., and his skill and zeal has been as conspicuous and satisfactory as heretofore." His examination into the physical properties of metals, and his long experience in "the practical work of making tests for their accurate determination, have given him an expert knowledge which well fits him to carry on experiments in this direction." We are pleased to see this commendation of Mr. Howard's ability, and have no doubt he deserves it; but we suppose that his time has been so fully employed in doing the drudgery of testing and recording details that there was no time for him to compare his work with what had been done previously, to make deductions from it, and to present a report in a condensed and readable shape, which would have been both a credit to himself and of value to the public. We have, at our own expense, had the abstracts made from the volume which are printed on another page. The figures there given engineers may take for what they are worth and compare with other data already in their possession, but this work of abridging and comparison should have been done by the author of the original report.

The unsatisfactory character of the work of the testing machine and of the report which has been made of it is only an additional argument to the many which have been given in the past ten years for the creation of a testing board such as the one which was appointed in 1875 and allowed to go out of existence by a parsimonious Congress. We venture to say that if the board which was created in 1875 had been allowed to remain in existence to the present time, with an appropriation of only \$10,000 per year, the tests which have been made and the reports which have been issued would have been of infinitely more value than those now under consideration.

It is unfortunate that the approach of winter witnesses another general reduction in wages. Hardly a day passes now without the publication of a reduction in several establishments, and the inference seems warranted that many works are scaling wages with as little publicity as possible. Competition in every line is now so close that even the most benevolent employers are obliged to reduce their wages cost to the level of their rivals. The situation is deplorable, but it cannot be helped now, and the only course open is to "make the best of it."

The Recent Advance in Lead.

Our market continued dull and depressed, since we last considered lead, till the end of September, when it took a sudden upward turn. This movement was in part speculative and in part because the fall demand had finally set in. Having during the dull summer months declined to 3½ cents, lead in a few days recovered to 3¾ cents and 3½ cents. Whether the latter figures can be maintained or pushed higher depends on consumption. Many in the trade are not very sanguine that consumption will be large, for, in their opinion, the demand has been too much delayed to attain any very great volume between now and the winter months. It is their belief that, this demand satisfied, we shall witness the same state of things as last year, namely, a sudden decline from which recovery will be slow.

As for domestic production this year, it is now estimated that it will be about the same as in 1883, when it was 125,000 tons of 2240 pounds, against 118,000 in 1882, 105,000 in 1881 and 87,300 in 1880, the increase between the latter year and 1884 being over 40 per cent. No prominent new districts have been opened in the West since those in New Mexico in 1883, while in some old districts a decline is threatened as the mines grow deeper and the character of the ore changes unfavorably. The impression is that there may be a decrease of production next year. Meanwhile powerful financial interests may step in and succeed in preventing a decline during the winter; but, on the other hand, the Richmond Company may change the policy they have adhered to so long and resolve to place their stock on the market and accept the current price, whatever it may be. If we take into consideration all the eventualities we have named, it will be confessed that lead values do not promise to increase in the near future. White lead in oil has been in fair jobbing request, but there has been no demand for large parcels. Owing to the advance in pig lead, values are firm at 5½ cents and dry at 5¼ cents.

In London soft Spanish dropped from £10. 17/6 to £10. 10/ when supplies were coming forward more freely; quarantine regulations were still interfering with the usual supply on account of the cholera in the Mediterranean countries. The imports and exports for January to July (seven months) were, as per the Board of Trade returns:

	1884.	1883.	1882.
Tons.	Tons.	Tons.	Tons.
Imports.....	61,382	67,018	63,048
Exports.....	18,891	25,889	24,567

Shipments from Spain during the first six months were 61,177 tons, against 61,863 in 1883 and 59,518 in 1882. The low price does not seem to interfere in the least with production in that country. The Aguila Company suffered during 1883 from the decline of values, which is estimated to have diminished their receipts as compared with 1882 about 410,000 pesetas of 20 cents American. In 1883 the company produced 32,024 tons of argentiferous lead ores, 51,532 tons of low-grade concentrating ore, 10,659 tons of silver ore, 85,758 tons of iron ore and 876 tons of copper ore. They made 13,199 tons of base bullion. Their receipts were 2,378,040 pesetas, and, deducting therefrom 982,802 pesetas for expenditure, there were left 1,395,238 pesetas gross profits. Out of this sum 130,000 pesetas were used to buy up shares and cancel them, 63,262 went toward the sinking fund, and out of the 1,200,000 pesetas remaining a dividend was declared of 20 francs per share. The Asturian Company, in spite of a 10 per cent. decline in spelter and 10 per cent. in lead as compared with prices in 1882, obtained a gross profit of 1,909,292 pesetas after writing off 500,000 for depreciation of plant. This profit was distributed as follows: Reserve fund, 331,858; interest, 77,434; dividend, 70 pesetas per share, or 400,000 pesetas.

Whether the hostilities which France has been carrying on against China will degenerate into open war will be known when the French Chambers meet in the middle of October. Should it be war, we shall soon hear what is to become of lead shipments from England to China while it lasts. As it is, the export from England, as shown above, has so far been very light, while the import has been free. Prospects in the lead market in Europe are certainly not encouraging.

Important News from Williamsport.

A very sensational dispatch about the depressed condition of the iron business appears in some of the daily papers. It is dated at Williamsport, Pa., which our readers will recognize as a very prominent iron-manufacturing point, containing at least one rolling mill and nail factory. It is many miles from a steel-rail mill, and is quite as far from any prominent blast-furnace center. A dispatch about the lumber trade would come much more appropriately from Williamsport than one about the iron trade. Yet the writer talks as though he were surrounded by the leading iron and steel establishments of the country, and labor leaders fresh from the furnace or the rolls were whispering important secrets in his credulous ear. He says:

Operators in steel-rail mills, in conjunction with other members of the Amalgamated Association of Iron and Steel Workers, are very much excited over the announcement that companies employing them propose to reduce wages from 10 to 20 per cent. Among the prominent firms that have already published notices of the decreased wages are the Cambria Iron and Steel Company, Johnstown; the Lackawanna Iron and Steel Company, Scranton; and the Pittsboro Iron and Steel Company. Under these there are a number

of smaller concerns scattered through Susquehanna, Lehigh, Allegheny, Schuylkill, Lebanon, Lackawanna and Wyoming valleys that have notified the men of the contemplated reduction in wages. Bessemer steel workmen are not organized, and are in no condition to make any opposition to the demands made upon them to work for lower wages. Secret meetings, where aggressive action has been taken against the proposed reduction in wages, have been held in Bethlehem, Scranton, Allentown and Johnstown, and it is believed in well-informed trade circles that a labor movement of large dimensions is among the early probabilities. Men at the works of the Chesapeake Iron and Nail Company, at Harrisburg, have been informed of the proposed reduction. Puddlers, who now receive \$4 per ton, will be paid \$3.50; nailers, who work by the keg, will be reduced 10 per cent., and inside hands generally will suffer a reduction of 10 per cent. It is understood that outdoor laborers will not be affected. The men are working 10 hours a day.

Such a hodge-podge is worthy of the source from which it emanates. It is a mixture of absurdities and contradictions. Names of companies are wrongly given; nail mills and rail mills are badly mixed; the reference to Allegheny County as one of the scattering localities in which "there are a number of smaller concerns" is supremely ridiculous. We forbear from reproducing an additional paragraph, in which the recent monthly statement of *The Iron Age*, showing the condition of the anthracite and bituminous furnaces of the country, is taken to mean all the furnaces, our omission of charcoal furnaces not having been observed or perhaps comprehended.

It is a matter of regret that such stupid blunders should find entrance into the columns of our most widely-circulated newspapers. The depression in the iron trade is serious, but the situation is not nearly so grave as this writer and other sensational newsmongers endeavor to make it appear. If the author of this dispatch is an *attaché* of any metropolitan journal he betrays such phenomenal capacity for blundering that he ought to be made permanent meteorological editor. If he is a "penny-linger," operating on his own account for what he can get, we hope our exposure of his shortcomings will cause newspapers to be more careful of dispatches from such sources on industrial topics.

The Henderson Steel Processes.

A syndicate of iron manufacturers has been formed to make trials of the Henderson gas open-hearth steel-melting furnace, and of Mr. Henderson's various processes for making soft steel to be used as a substitute for puddled iron, with the view of changing their works to the new processes. It is composed of the E. & G. Brooke Iron Company, the Reading Iron Works, the Montour Iron and Steel Company, Charles L. Bailey & Co., A. Pardee, Jr.; Wm. McIlvain & Sons, John O. Hughes, of Hughes & Patterson; Marshall Brothers & Co., the Old Dominion Iron and Nail Company and Charles G. Fracklyn. Trials are in progress with a 2-ton furnace at Bellefonte, Pa., which so far have been satisfactory, the waste and fuel being less than has heretofore obtained in other furnaces or the Bessemer converter. With a small outlay for plant, labor and repairs, great advantages over other established systems of making steel are claimed to iron manufacturers who are about to change to steel. Mr. Henderson uses all kinds of pig or scrap iron or steel, removes copper, sulphur and phosphorus, and produces open-hearth soft steel, with 0.12 per cent to any higher degree of carbon, uniformly and as required.

The syndicate represents several millions of capital. It has formed a pool of \$100,000, of which Morton C. McIlvain, of Reading, is treasurer, and will furnish Mr. Henderson with money to continue his experiments. If the furnace, after a thorough trial, realizes expectations, the syndicate will control the patents and build works for steel production on a large scale. Samples of the steel have already been sent out to the parties interested, and have been tested for various purposes with fair results. At the McIlvain boiler-plate mill, in Reading, the Henderson steel has been rolled, bent, twisted and punched the same as iron. The members of the syndicate expect to substitute this steel for iron in their respective works, which represent a variety of products, such as boiler plate, sheets, pipe, nails, flash plates, spikes, bar iron, rails, &c. This is certainly a very impressive indication of the tendency to abandon the old iron-making processes in favor of some method of producing steel.

The President has transferred Hon. W. Q. Gresham from the Post Office Department to the Treasury Department. The change from Postmaster-General to Secretary of the Treasury was made late on the night of the 24th ult. Secretary Gresham will have at most only five months to serve in his new position, but rumor gives him a much shorter term, the appointment, it is alleged, being a temporary one, soon to be followed by a number of official changes. This is merely conjectural, however, and the new Secretary may serve for the remainder of the Presidential term. He is described as a man of positive character, and, although he has had a judicial training, he exhibits as an executive officer the utmost indifference to precedent. The Treasury Department needs such a head perhaps more than any other branch of the Government. If the new Secretary manages Treasury affairs as he has done those of his former department there will be cause for congratulation over the transfer.

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The Decline in Copper.

Since we last considered copper in these columns, quite a decline has taken place in the American market, the Lake companies having sold to manufacturers 20,000,000 pounds at 13 cents, delivery spread over several months. Early last year this copper brought 18½ cents, which shows a decline of about 30 per cent. The main cause of this decline has been the enormous output that has again been going on this year, the estimate being 68,000,000 pounds of Lake, 40,000,000 Montana, 22,000,000 Arizona, and 3,000,000 from other sources; together, 133,000,000 pounds. Out of this amount there have been shipped and contracted for to the end of the year 10,000,000 pounds of Lake, 32,000,000 Montana and 5,000,000 Arizona, &c., which will figure up a total for export of 47,000,000 pounds. This would leave available for home use 58,000,000 pounds of Lake, 8,000,000 Montana and 20,000,000 Arizona and other copper; together, 86,000,000 pounds; and as consumption is not likely to exceed 80,000,000 pounds of all sorts, there will result a surplus of 6,000,000 pounds to swell the stock on January 1 next beyond what it was last January. The prospects are that next year the general output in this country will be still greater, and, unless mines not paying cease operations, the outlook is anything but reassuring to the producer.

Europe has been but badly prepared to receive this year a supply of over 20,000 tons from the United States, and in consequence the market there has given way to the lowest figures since 1879. The price would have gone still lower if the deliveries had not been as large as they have been, maintaining a favorable statistical position despite the free arrivals from all quarters. It was confidently believed that the low price of Chili bars would cause production to be materially reduced on the West Coast, but this has not been the case. In Spain the cholera has so far been confined to the vicinity of Alicante; should it spread to the copper-mining regions near Huelva, it would, of course, interfere with supplies from there, but the case has not yet arisen. Hence, there is no important copper-producing country in which there are indications at this writing of any material decrease of production, in spite of ruling low figures. Consumers may, therefore, congratulate themselves upon the prospect, and take advantage of the situation while it lasts. Were it not for the extraordinary increase of production in the United States and Spain the price of Chili bars would perhaps be double what it is at present, considering that Chilean production declined between 10,000 and 15,000 tons during the war on the Pacific, and has not recovered since the war terminated.

Meanwhile, our merchants in the export trade to Spanish America, Brazil and the British Colonies all express the hope that American manufacturers of brass goods, with the low raw material now at their command, may be induced to better co-operate with them in pushing the sale of their goods in those countries. They ought to be able to furnish such goods of the same quality as cheap as those shipped from England, France and Germany; in ornamentation and shape American brass goods are as tasteful as those from France, and it is really only a matter of enterprise and energy to be able to compete in South America successfully with goods in this line coming from Europe. If we continue to neglect this field, so handy to us, we shall find it all the more difficult to gain a firm foothold there when the time comes, as assuredly it will, that we shall be compelled to look beyond our own frontiers for a market. The home market is no doubt the most desirable so long as it is brisk and remunerative, but, with our large productive capacity and rapid methods of manufacturing, periods of oversupply and stagnation and excessive competition will be more or less frequent. Let a serious and prolonged reaction come in real estate and building—which is certain to set in sooner or later—and there will be a glut at once, leading to stoppages and losses. For such a period the creation of a good export trade, even at very moderate profits, will be necessary to the brass trade. Hence there is every reason to make a systematic effort to enable exporters to push this trade by making prices as low as the same class of goods sent out by European countries. In Europe they have two prices, one for home consumption and one for export, and the latter is always the lowest. Manufacturers are resigned to small profits in the export trade, so as to get the goods out of the way, especially those exposed to the caprices of fashion, and our manufacturers might profitably imitate the foreign manufacturer in this respect.

It will be remembered that last fall a serious drought affected the manufacture of iron in some sections of this country, the supply of water running so low as to stop rolling mills and furnaces operated by steam-power as well as those operated by water-power. Indications point strongly to a recurrence of that state of affairs during this season. Unless a copious rain fall takes place soon a number of rolling mills in the Eastern part of the country will be obliged to suspend operations.

Almost every year the manufacture of iron is being introduced into a State or Territory not before classed among iron producers. We have already noted the starting of rolling mills this year in Minnesota and Texas, in which States only pig iron

had previously been manufactured. Now Iowa is about to join the column of iron producers, the first iron-manufacturing enterprise of any kind within her limits being the rolling mill at Burlington which is to be started in October by the Burlington Rolling Mill Company to make merchant bar from scrap.

The American Institute Fair was opened in this city on Wednesday of last week, Hon. Abram S. Hewitt delivering an interesting address in honor of the event, taking for his theme the progress of the age. This is the 53d industrial exhibition of the Institute, and it promises to be at least as successful as former ones, the list of exhibitors and exhibits outnumbering those of any previous fair. In exhibiting the progress of industry and invention this year's display far surpasses any former one.

Steam propulsion in ocean navigation is wonderful in its achievements and still more so in its possibilities. The outgoing fleet from this port for Europe last Saturday numbered not less than 16 large steamships, some of them loaded to their utmost capacity, an occurrence said to be without precedent in the history of the port. As the latest-built steamers consume only 125 to 180 tons of coal in making seven-day trips across the Atlantic, instead of 200 to 250, as formerly, steam seems destined to make a complete conquest in all navigable waters.

Phosphorus Determinations.

We are in receipt of the following communication from Carl A. Meissner, of Youngstown, Ohio, whose investigations in the determination of phosphorus have appeared in former issues of this journal:

YOUNGSTOWN, OHIO, Sept. 18, 1884.

To the Editor of The Iron Age.—Sir: While gathering the information on the phosphorus question contained in your recent issue, a number of chemists have been spoken to in regard to the advisability of attempting a more definite combination on this subject. There is at present no chemical society large and influential enough to take the matter in hand, and what seems wanting is united action on the part of all well-educated and graduated chemists, which action can only be attained by forming a society broad and comprehensive enough to include all branches of the business, and still close enough to keep out all who might, from lack of education or otherwise, injure the profession through irresponsible results. A society of this kind would be very far-reaching in its influence, and if manufacturers would not only encourage, but urge, their chemists to take active steps in this direction, there would no difficulty in organizing one, the beneficial influence of which would soon make itself felt in necessitating a thorough education and training before taking charge of a laboratory. It appears to us that Pittsburgh would be the place to start this movement, for by taking in all its manufacturing establishments, together with those of the surrounding districts, a very firm and efficient nucleus could be formed, which would soon attract to itself additions from all parts of the country. This seems all that we can urge in this matter; it now remains for the prominent iron firms and chemists to take further active steps in this direction. That this will and must come sooner or later there seems to be little doubt, the only question being, is the present time propitious for such an undertaking? We firmly believe it is, and are convinced that the advantages gained thereby will present themselves to all thinking readers as tending to strengthen the profession, create more cordial feelings between seller and buyer, begot confidence and, above all, gain that greatly desired object of all fair-minded business men—a uniformity of results through a uniformity of methods.

Very truly yours, CARL A. MEISSNER.

The only objection we see to the organization of a chemical society is that there are already so many scientific societies in existence that it is doubtful if the organization of another could be successfully undertaken. The American Institute of Mining Engineers already includes a large proportion of the representative metallurgical elements, and its transactions are full of papers of value to this class of investigators. There is no other society in which the question of uniformity of methods in phosphorus determinations can be so fully or profitably discussed, if brought up, or where more side lights would be thrown on the subject by gentlemen eminently qualified to speak who would not be found in the membership of a chemical society. The subdivision of scientific societies can, we think, be carried further than is profitable, and specialists do not always learn as much when conferring by themselves as when helped by those who have gained knowledge in lines outside of those in which specialists usually work. The history of the solution of the phosphorus problem in iron metallurgy shows that the chemist and metallurgist need to work together.

The Dangerous Friction Match.

A correspondent calls our attention in the following letter to a subject of great importance in connection with the cause of fires:

GREAT FALLS MANUFACTURING CO., ROCHESTER, N. Y., Sept. 28, 1884.

To the Editor of The Iron Age.—Sir: I read with much interest in The Iron Age of the 18th Mr. W. C. Dodge's communication on the origin of mysterious fires. I think Mr. Dodge overlooked the most prolific source of "mysterious fires"—that is, friction matches. Friction matches are to be found in every household in the country, in boxes and scattered about generally in the pockets of men and boys. Everybody carries them. Fires are often produced by mice and rats nibbling at them. I have seen them in their nests; have known fire to originate between the ceiling and weatherboards, caused by mice and matches. I have known

a cotton mill fired by friction matches in a bale of cotton, ignited by the machinery. It is quite common for cotton gins to be burned all over the South, and most of these fires, I believe, originate from loose matches getting into the seed cotton before it goes to the gin. There are friction matches that will ignite only on the prepared surface of the box. If our Congress would tax all friction matches heavily, except those which ignite only on the prepared surface of the box, incendiary fires would be rare and a great many of the "mysterious fires" would not be heard of, insurance would be greatly reduced and great good done.

Truly yours, &c., ROBERT STEELE, Pres.

The remarks of our correspondent are timely and forcible. Ordinary friction matches, especially those popularly designated as "parlor matches," are regarded with disfavor by many persons, and numerous housekeepers and business men are discarding them for the "safety match" alluded to by our correspondent, which can be ignited only on a specially prepared surface. We are not sure that our correspondent's suggestion of a discriminating tax on the ordinary friction match is practicable, but, if such a measure could be enforced, we believe with him that the number of fires would be greatly decreased. So much valuable property is destroyed by fire every year in the United States that the subject of prevention seems to be a proper one for legislation. As insurance companies are the direct sufferers, they should take the initiative in making the necessary recommendations, which would doubtless receive attention from State Legislatures if not from Congress itself, whose jurisdiction in such a matter might be questioned.

Abstracts from the Report of the Work of the Watertown Testing Machine.

From the recently published Government report of the commanding officer of the Watertown Arsenal of the tests of iron and steel and other materials for industrial purposes, made with the United States testing machine during the fiscal year ended June 30, 1883, we have made the abstracts given in the tables below. The Government report is very complete in giving all the details of every test made, but it is singularly deficient in summaries, conclusions or generalizations from the work. The results given in the condensed tables below, we think, are the most important recorded in the volume. Engineers may find it well to cut them out and file with their notes on strength of materials, as they will not be likely to obtain the results in such condensed form from other sources:

TENSILE TESTS OF GROOVED PIECES OF IRON AND STEEL PLATES.

The plates were ¾ inch, ½ inch, ¼ inch and ⅛ inch thick, and from 1 to 4 inches wide, varying by half inches at bottom of grooves. The grooves, punched or drilled, were ½ inch radius. The following are average results on tests of ½-inch plates, tensile strength, pounds per square inch:

Inches wide.	1 in.	2 in.	3 in.	4 in.
Iron, drilled....	47,755	48,770	46,000	45,480
" punched....	50,830	49,960	38,120	39,940
Steel, drilled....	66,900	67,250	66,280	64,530
" punched....	68,150	60,130	61,330	51,310

TENSILE TESTS OF RIVETED JOINTS, IRON AND STEEL PLATES.

Thickness plate, inches.	Diam. rivets, inches.	Diam. punched holes, inches.	Width plate tested, inches.	No. rivets.	Pitch rivets, inches.	Ten. str. joint in net sec. of plate per sq. in., lbs.	Ten. str. plate per sq. in., lbs.	Efficiency of joint, per cent.
11-16	¾	10/16	6	6	1 1/2	39,900	47,180	47.0
11-16	¾	10/16	6	6	1 1/2	41,000	47,180	49.0
11-16	¾	10/16	6	6	1 1/2	35,650	44,615	46.6
11-16	¾	10/16	6	6	1 1/2	46,900	47,180	59.9
11-16	¾	10/16	6	6	1 1/2	46,875	47,180	60.5
11-16	¾	10/16	6	6	1 1/2	46,400	44,615	59.4
11-16	¾	10/16	6	6	1 1/2	46,140	44,615	59.4
11-16	¾	10/16	6	6	1 1/2	41,350	44,615	57.2
11-16	¾	10/16	6	6	1 1/2	42,350	44,615	54.9
11-16	¾	10/16	6	6	1 1/2	49,310	48,590	52.1
11-16	¾	10/16	6	6	1 1/2	41,920	45,590	51.7
11-16	¾	10/16	6	6	1 1/2	61,270	53,330	62.8
11-16	¾	10/16	6	6	1 1/2	60,880	53,330	59.1
11-16	¾	10/16	6	6	1 1/2	47,580	57,215	40.8
11-16	¾	10/16	6	6	1 1/2	49,840	57,215	42.8
11-16	¾	10/16	6	6	1 1/2	62,710	53,330	71.7
11-16	¾	10/16	6	6	1 1/2	61,310	53,330	69.8
11-16	¾	10/16	6	6	1 1/2	68,900	57,215	57.1
11-16	¾	10/16	6	6	1 1/2	66,710	57,215	55.0
11-16	¾	10/16	6	6	1 1/2	62,150	54,445	63.4
11-16	¾	10/16	6	6	1 1/2	68,560	54,445	63.5
11-16	¾	10/16	6	6	1 1/2	54,650	51,545	54.3
11-16	¾	10/16	6	6	1 1/2	54,300	51,545	53.4

* Iron. * Steel. * Lap joint. * Butt joint.

The efficiency of the joints is found by dividing the maximum tensile stress on the gross sectional area of plate by the tensile strength of the material.

COMPRESSION TESTS OF 3 X 3 INCH WROUGHT-IRON BARS.

Length, inches.	Ult. comp. str. per sq. in., lbs.	Tested with two pin ends, pins 1 1/2 in. diam.	Tested with one pin end and one pin end, pins 1 1/2 in. diam.
30	28,360	28,360	28,360
60	28,310	28,310	28,310
90	28,640	28,640	28,640
120	28,360	28,360	28,360
150	28,640	28,640	28,640
180	28,360	28,360	28,360

Tested With Two Pin Ends.—Length of Bars, 120 Inches.

Diameter of pins, inches.	Ult. comp. str. per sq. in., lbs.
1 1/2	16,350
1 3/4	17,740
2	20,300
2 1/4	21,400
2 3/4	21,510

COMPRESSION OF MANUFACTURED STONE.

Specimen from the Flintolite Stone and Marble Company, New York. Size, a 2 1/2-inch cube nearly. Ultimate crushing strength, 15,450 = 1588 pounds per square inch.

TESTS OF CALIFORNIA LAUREL WOOD (WHITE LAUREL).

Compression test of block, 6 x 4 x 40; ultimate strength, 7500 pounds per square inch. Indentation test.—Indented area, 5.97 square inches; loads for indentations of .05 inch, two tests, 2400 pounds and 3110 pounds.

Shearing Parallel to Grain.—Shearing in two planes, two tests, 1110 and 1460 pounds per square inch. Shearing in one plane, two tests, 880 and 770 pounds per square inch. Transverse Tests.—Specimen, 3 1/2 x 3 1/2 x 44 inches between supports; breaking load, 10,000 pounds; modulus of rupture, $R = \frac{6}{4} \frac{PL}{bd^2} = 13,070$ pounds. Other tests gave for R, 16,000, 13,990, 9630, 8480 and 18,440 pounds.

Tests of Yellow Laurel.—R = 15,050, 13,260, 12,810 and 13,630 pounds.

Tensile Tests, Specimens 1-inch Diameter.—White laurel, 19,320, 20,000 and 27,660 pounds per square inch. Yellow laurel, 17,990, 10,880 and 28,460 pounds per square inch.

TENSILE TEST OF SIX STEEL EYE-BARS.

The steel was made by the Cambria Iron Company (Pernot open-hearth) rolled at Union Iron Mill, Pittsburgh, and the eye-bar heads made by Keystone Bridge Company by upsetting and hammering. All the bars were made from one ingot. Two test-pieces, 3/4-inch round, rolled from a test-ingot, gave elastic limit, 48,040 and 42,210 pounds; tensile strength, 73,150 and 69,470 pounds, and elongation in 8 inches, 22.4 and 25.6 per cent. respectively. The ingot from which the eye-bars were made was 14 inches square, rolled to billet, 7 x 8 inches. The eye-bars were rolled to 6 1/2 x 1 inch. Numerous chemical tests gave carbon (by color) .27 to .30; manganese, .64 to .73; phosphorus, .074 to .098.

No. of test.	Gauged length, in.	Elastic limit, lbs. per sq. in.	Tensile strength, lbs. per sq. in.	Elongation per cent. in gauged length.
4,583	100	47,480	67,300	15.8
4,584	100	46,550	64,000	6.96
4,585	100	47,480	71,560	8.6
4,586	100	47,480	68,730	12.3
4,587	100	46,550	65,850	12.0
4,588	100	46,550	64,410	15.4
4,589	100	47,480	68,250	13.9

No. 4583 broke across neck; all the others broke in stem.

COMPRESSION TESTS OF BRICKS.

The bricks were tested between flat steel buttresses. Compressed surfaces (the largest surface) ground approximately flat. The bricks were all about 2 to 2 1/2 inches thick, 7 1/2 to 8 1/2 inches long, and 3 1/2 to 3 7/8 inches wide:

Test.	Length, in.	Comp. area, sq. in.	Ult. strength, lbs. per sq. in.	Total lbs. per sq. in.
Eastern face bricks....	28.68	317.100	11,056	3,500
" "	29.14	407.500	13,964	4,800
" "	28.85	449.300	16,734	5,500
Common Eastern bricks....	28.42	562.300	19,735	6,500
" "	28.12	628.500	22,351	7,400
" "	28.32	581.000	19,995	6,600
Old Bay State bricks....	28.50	318.600	11,130	3,600
" "	28.70	365.900	12,709	4,200
" "	28.95	280.000	10,590	3,500

Twelve other tests were made, with results of from 5000 to 10,000 pounds per square inch.

COMPRESSION OF WROUGHT-IRON COLUMNS, LATTICED BOX AND SOLID WEB.

All Tested with Pin Ends.

Columns made of	Length, ft.	Sectional area, sq. in.	Total weight of column, pounds.	Ult. str. per sq. in., pounds.
6-inch channel, solid web....	10.0	9,831	432	30,320
6-inch channel, solid web....	10.0	10,190	446	31,330
6-inch channel, solid web....	15.0	9,977	508	35,100
6-inch channel, solid web....	15.0	9,977	508	21,050
6-inch channel, solid web....	20.0	9,782	785	19,380
6-inch channel, solid web....	20.0	9,768	755	16,220
8-inch channel, solid web....	20.0	16,077	1,275	36,490
8-inch channel, solid web....	20.0	16,281	1,290	22,540
8-inch channel, solid web....	25.8	16,170	1,660	19,750
8-inch channel, solid web....	25.8	16,141	1,645	17,570
Eight channels, with 5-16-in. continuous plates....	20.8	17,968	1,734	26,480
Eight channels, with 5-16-in. continuous plates....	26.8	19,417	1,940	25,290
5-16-inch continuous plates and angles....	20.8	16,108	1,765	28,020
Width of plates, 12 in., 1 in. and 7.85 in. plates and angles....	26.8	16,267	1,798	27,910
7-16-inch continuous plates and angles....	25.8	20,954	2,342	25,770
Plates 12 in. wide....	25.8	20,618	2,225	25,930
8-inch channels, laticed....	13.3	7,626	670	38,910
8-inch channels, laticed....	13.3	8,056	707	36,580
8-inch channels, laticed....	20.0	7,621	924	34,130
8-inch channels, laticed....	20.0	7,621	928	33,410
8-inch channels, laticed....	25.8	7,705	1,365	31,610
8-inch channels, laticed....	25.8	7,678	1,355	29,870
8-inch channels, laticed....	13.4	7,645	664	34,510
8-inch channels, laticed....	13.4	7,624	684	33,530
8-inch channels, laticed....	20.0	7,517	921	33,890
8-inch channels, laticed....	20.0	7,531	969	34,390
8-inch channels, laticed....	25.8	7,601	1,277	30,840
8-inch channels, laticed....	25.8	7,708	1,290	30,770
10-inch channels, laticed....	16.8	11,044	1,470	33,740
10-inch channels, laticed....	16.8	11,902	1,475	34,670
10-inch channels, laticed....	25.0	12,148	1,784	33,630
10-inch channels, laticed....	25.0	12,175	1,926	32,440
10-inch channels, laticed....	10.7	12,968	1,540	31,130
10-inch channels, laticed....	16.7	12,659	1,588	31,900
10-inch channels, laticed....	25.0	11,930	1,951	32,890
10-inch channels, laticed....	25.0	11,082	1,982	32,740
10-inch channels, laticed....	25.0	17,622	1,848	26,190
10-inch channels, laticed....	25.0	17,331	1,867	26,180
10-inch channels, laticed....	25.0	17,570	1,845	17,430
10-inch channels, laticed....	25.0	17,721	1,837	17,370

* Pins in center of gravity of channel bars and continuous plate, 1.68 inches from center line of channel bars.
* Pins placed in center of gravity of channel bars.

EFFECT OF COLD-DRAWING ON STEEL.

Three tensile bars and two compression bars, cut from the same bar of hot-rolled steel, from the Norway Steel and Iron Company:

	Tensile strength per sq. in., lbs.
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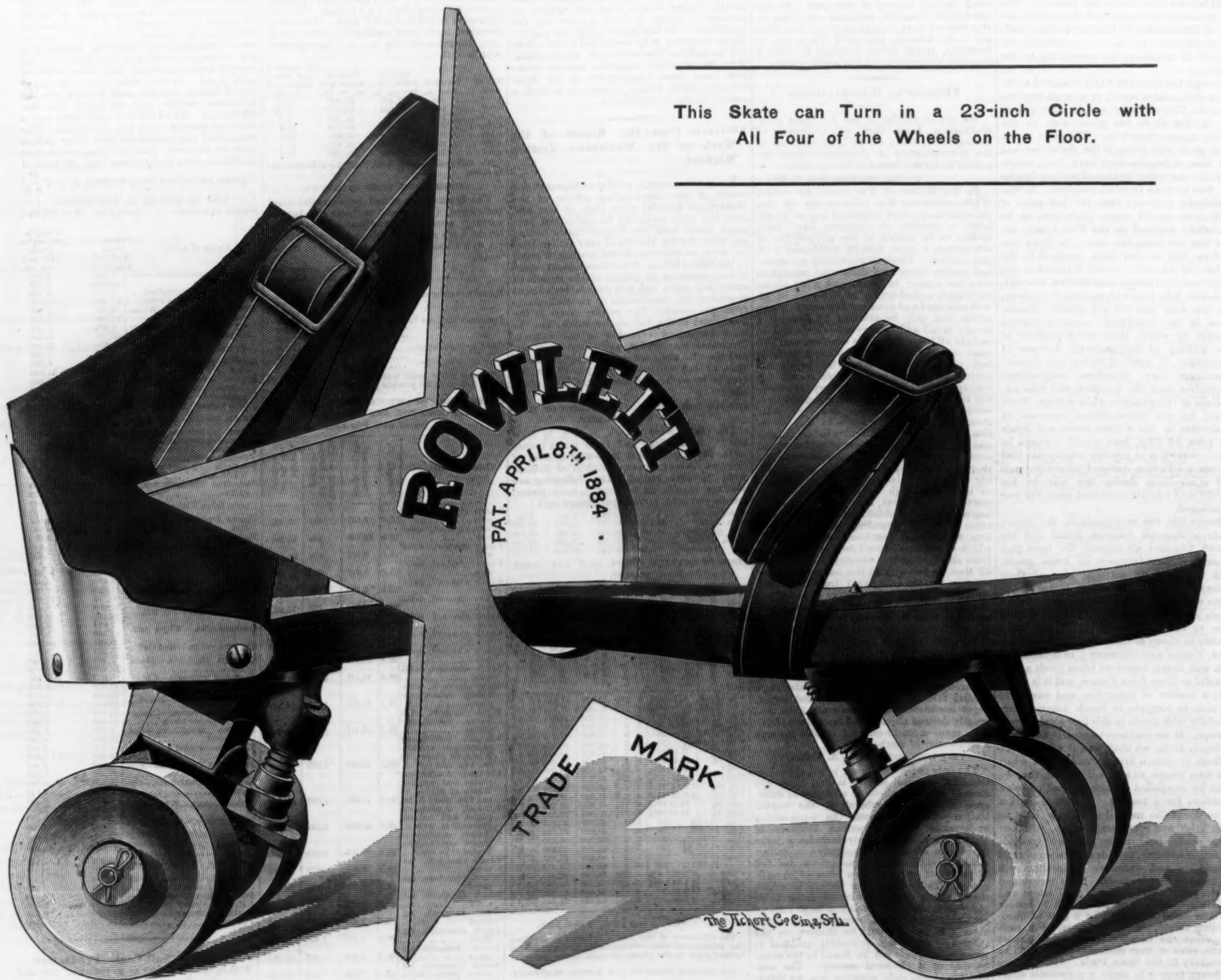
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For Easy Running and Best Motion it has No Equal. Especially adapted for Rink Purposes on account of its Strength in the Mechanism.

IT IS THE LIGHTEST SKATE IN THE MARKET,

AND THEREFORE A SPECIAL FAVORITE WITH LADIES AND CHILDREN.

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This Skate can Turn in a 23-inch Circle with All Four of the Wheels on the Floor.

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We will have our *Star Steel Club Skate* completed for the *Trade* by October 15. It will defy competition.

PLEASE MENTION "THE IRON AGE."

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We are prepared to receive **PIG IRON**, **BLOOMS**, **Ingot**, **Muck**, **RAIL** and **Sheet** **IRON**, **Car Wheels**, **Rails**, **LUTHER**, **ONE**, &c., also every kind of merchandise, on storage. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. We shall be glad to furnish full particulars as to the manner of transacting business, and invite correspondence or personal interview.

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Commission Merchant,

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Trade Report.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, October 1, 1884.

Scotch Pig.—The market is a little steadier. We quote makers' brands as follows:

Cottbus, alongside, Glasgow	50/6
Langloan, " "	50/6
Gartsherrie, " "	50/6
Summerlee, " "	50/6
Carnbroe, " "	50/6
Glenarnock, " "	50/6
Edinburgh, " "	44/6
Dalmellington, " "	47/6
Shotts, " "	54/6
Lighterage from Ardrossan to Glasgow is 1/10 ton.	

Cleveland Pig.—The market is unchanged. We quote as follows, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry	41/
" " No. 2 "	39/
" " No. 3 "	37/ @ 37/8
" " No. 4 Forge "	36/

Bessemer Pig.—No change in the condition of the market. We quote W. C. Hematites 44/6 @ 46/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is a little firmer. We quote nominally at works:

Staff. Ord. Marked Bars	7 10 0 @ 10 10 0
" " Medium "	6 0 0 @ 6 10 0
" " Common "	5 10 0 @ 5 15 0

Hoops, 20 W. G. and over	6 15 0 @ 6 15 0
" " Common Best "	6 5 0 @ 6 10 0
" " Medium "	6 0 0 @ 6 7 6
" " Common "	6 0 0 @ 6 7 6

Sheets, 20 W. G. and under	7 15 0 @ 8 5 0
" " Ordinary Best "	7 0 0 @ 7 10 0
" " Common "	4 17 6 @ 5 2 6

Steel Rails.—Are unchanged. Ordinary Sections are quoted at £4. 15 @ £4. 17/6, f.o.b. shipping ports.

Old Rails.—Are a little steadier. We quote Old D. H. S. £2. 17/6 @ £3. c.i.f. New York.

Scrap.—The market is a little firmer. Heavy Wrought is quoted £2. 10/ @ £2. 12/6, c.i.f. New York.

Copper.—The market is a little steadier. We quote Best Selected, £59 @ £60, and Chili Bars, £54 @ £54. 5/.

Tin.—Market irregular. We quote Straits Ingots, spot, £79 @ £80, and futures, 79. 10/ @ £80. 5/.

Tin Plates.—No change to note. We quote:

Tin Plates, 10x14, 1st qual. Charcoal	10/6 @ 21/6
" " 2d " "	18/6 @ 19/
" " 1st " Coke	17/6 @ 18/
" " 2d " "	15/ @ 15/6

Spelter.—The market is a little steadier. We quote Ordinary, at shipping ports, £14. 10/ @ £14. 12/6.

Lead.—The market is quiet. We quote Common English Pig, £10. 15/ @ £11.

Freights.—Steam from Glasgow to New York, 2/6 @ 3/; Liverpool to New York, 5/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, October 1, 1884.

Opinions are somewhat at variance respecting the condition of general trade compared with one week ago, but we may as well concede that there is little change. The price of steel rails is undoubtedly firmer, but has not sensibly advanced, and in the iron trade the feeling is better. A still more hopeful indication is the continued reduced volume of the import trade, taken together with the prospects of a more liberal movement in exports. The future for railroad rates is uncertain, for, while Commissioner Fink orders the restoration of Western rates to take effect 1st inst., it may appear that the pool managers are powerless to stem the tide of disaffection. After a considerable boom in wheat, attended with active speculative trading, prices once more tend to a lower level, both West and here, and corn is a little off. Under favorable conditions exporters will manifest more interest. It is understood that the Western corn combination was broken by the heavy receipts.

Returns for the week from the leading clearing houses in the United States indicate a moderate increase in the volume of business—New York excepted—compared with the previous week. Compared with the corresponding week one year ago the total decrease is 30 %; outside of New York, 13 %. The decrease is least noticeable in the West and Northwest. The movement of merchandise is doubtless below the average, notwithstanding the competition of railroads in cutting rates. Of the local situation one of our contemporaries says, after careful inquiry in the various lines of trade: "The view is general that, though the margin of profits is smaller and the money value of sales is less, the amount of goods sold this year is nearly as great as last year, and in some cases considerably greater. Purchases are made in smaller quantities, but more frequently. Credits are notably reduced, but payments are more prompt and sure. Greater caution is observed as to overstocking, but the demand is steady and the movement regular and healthy. The expectation of those most familiar with the situation is that the net result of the year's business, when the usual annual inventory is taken in January, will be decidedly more satisfactory than it has been for the last two

years." The opinion is generally ventured that, irrespective of Wall street, the tendency is now "definitely and decidedly, though not strongly," in a direction vertical to the hard-pan.

According to our commercial reports, in Boston the general trade movement shows no material improvement, chiefly on account of small profits; manufacturers are working at a loss. In Philadelphia the situation, as a whole, is little more encouraging; the restriction on orders frequently limits sales. At Baltimore business is in good condition. At Cincinnati many of the industries are idle; others are on half-time. In St. Louis there is "a continued activity pleasant to contemplate." In Minneapolis sales have slackened to some extent. At Charleston, Savannah and other Southern points there is a satisfactory business, and in New Orleans nearly all lines show "unmistakable signs of revival." At Montreal the grain movement is restricted by low prices.

On the Stock Exchange the market during the past week has been irregular, but advanced toward the close under speculative manipulation. On Thursday New York Central was broken on reports that the company had authorized the issue of \$10,000,000 5 % debenture bonds, of which it was subsequently ascertained \$6,500,000 were readily sold in London, the remainder being reserved to retire Hudson River second mortgage due in 1885. On Friday there was a further advance in the general list, but the Vanderbilts were weak, particularly the New York Central, which touched its lowest point. On Saturday, aside from Central, the market was strong. A reported interview with Mr. Vanderbilt, in one of the morning journals, though of a bullish tendency, had no effect. On Monday there was an advance of about 1 % in the leading stocks, mainly due to the closing out of short contracts. Gould's brokers were supposed to be the engineers of the day's work. On Tuesday the market continued strong under the support of bull cliques, Union Pacific, Lake Shore and Northwest were all more active than before for several days, and the Vanderbilts partially recovered. To-day there were signs of reaction; quotations as follows: Burlington and Quincy, 123; Canada Southern, 34 1/2; Colorado Coal, 9 1/2; Lackawanna, 109 3/4; Erie, 13 1/2; Kansas and Texas, 18 1/2; Lake Shore, 75 1/2; Louisville and Nashville, 28 1/2; Michigan Central, 63 1/4; New York Central, 95; Jersey Central, 51; Northwest, 92; North Pacific, 21; North Pacific preferred, 45 1/4; Oregon Transcontinental, 14 1/4; Pacific Mail, 51 1/2; St. Paul, 77 1/2; Omaha, 32 1/2; Texas and Pacific, 12 1/2; Union Pacific, 53 1/2; Western Union Telegraph, 64 1/4; Central Pacific, 40 1/4; Manhattan consolidated, 73 1/2.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	107	107
U. S. 4 1/2, 1891, coupon	112 1/4	112 3/4
U. S. 4 1/2, 1907, coupon	120 1/4	120 3/4
U. S. Currency 6 1/2, 1895	120	120
U. S. Currency 6 1/2, 1896	120	120
U. S. Currency 6 1/2, 1897	120	120
U. S. Currency 6 1/2, 1898	120	120
U. S. Currency 6 1/2, 1899	120	120
* Ex-interest		

The bank returns for the week show no important change. Although there was a considerable demand for money in the South, to assist in moving cotton, there was but a small decrease in the unusually large surplus reserve, which now stands at \$27,935,725, against \$27,425 at the same time last year, and \$2,087,425 below the corresponding date in 1881. It is still difficult to find profitable employment for money, call and time loans being made only at low rates of interest, and the prospect is fair for an easy market for some months to come.

The receipts of foreign merchandise at this port continue on a limited scale, the total for the past week being \$6,889,728, of which \$4,826,128 represent general merchandise, and the remainder, \$2,063,600, dry goods. Since January 1 the total is \$326,743,878, compared with \$347,404,542 for the corresponding period of 1883. The imports of dry goods for September were valued at \$9,741,647, a decrease of nearly 10 % compared with September, 1883. The exports of domestic produce from this port for the week were \$5,999,960, against \$7,068,717 for the previous week and \$6,826,497 for the week ended October 2, 1883. Breadstuffs, provisions, cotton and petroleum were the chief features. The total since January 1 was \$243,788,183, against \$268,439,145 the same time last year. According to the Custom House report the imports of specie at this port for the week were \$600,000, mostly in foreign gold from Havana, and the exports for the same time were \$272,622, principally in silver. Taking the foreign trade of the United States for the eight months of the calendar year ended August 31, the official returns show that, after deducting specie, the surplus accruing from exported merchandise is not quite \$14,000,000, against \$44,779,191 for the corresponding period in 1883.

The supply of first-class commercial paper is good, but demand limited. We quote indorsed bills receivable 5 1/2 % @ 6 %. In the West, according to the Chicago Tribune, "surprise has been expressed at the evidence of financial strength on the part of the rural population that has been shown lately. Word comes from all quarters that the farmers will continue to hold their wheat till they can get a fair price for it." Sterling exchange is rather heavy, which fact is mainly ascribed to recent bond negotiations in New York Central and a better supply of cotton bills. In reference to future gold movements the London Economist, 20th ult., says: "The New York and German

quotations are now very distinctly adverse to this country, and, although they are not down quite to the gold-moving point, they are so close there that they should be watched carefully." The Acting Secretary of the Treasury issued the one hundred and thirty-first call for the redemption of bonds. The call is for \$10,000,000 of the 3 % loan of 1882, and notice is given that the principal and accrued interest will be paid at the Treasury on the 1st day of November next, and that the interest will cease on that day. The reduction of the public debt during the month of September is estimated at a little more than \$13,000,000.

A carload of merchandise, direct from St. Louis for Tamaulipas, in Mexico, was sent out on the 27th ult. The shipment comprised hardware, sugar-cane mills, pumps and agricultural implements.

The average price of wheat in London last month was 31/4, against 41/8 one year ago. The Baltimore and Ohio Railroad Company are said to be making large purchases of steel rails, giving for the same promissory notes.

The latest quarterly statement of the condition of the State banks in this city shows that on September 20 the aggregate liabilities were \$87,692,800—an increase of \$718,700. These figures include \$14,083,300 of capital, \$57,571,400 due depositors, and \$173,000 of unpaid dividends. Under the head of resources occurs the item of \$60,937,500 of loans and discounts, which is a decrease from the preceding quarter of \$2,685,700. A new bank has been organized to take the place of the defunct Atlantic State Bank, the suspension of which was caused by the failure of George I. Seney. The new institution is to be known as the Kings County Bank; capital stock, \$100,000. The creditors of the Marine Bank are about to receive a dividend of 10 %, and the Comptroller of the Currency says there is every prospect of a speedy settlement of questions connected with the Clearing House. The Metropolitan National Bank of New York City has reduced its circulation \$1,250,900 by the deposit of the proceeds of \$1,400,000 3 % bonds called for payment September 30.

Metal Market.

Copper.—The market since our last report has remained featureless and dull, with sales of some 100,000 lb Lake Superior at 13 1/2 % @ 13 3/4 %, other brands at the same time bringing 12 1/2 % @ 12 3/4 %. Shipments of Ore and Ingots have been very large during the week both to England and France. Messrs. James Lewis & Son, Liverpool September 16, write as follows: "The sales of Chili Bars made during the fortnight, and which have been to a large extent for consumption, have been at £53. 17/6 up to £54. 7/6 for sharp cash and £54 @ £54. 10/ for three months' prompt. The transactions in furnace material have been only on a moderate scale, smelters being supplied with the large arrivals of American Ore—4226 tons—sold previous to arrival; 10,000 tons (2000 lb) of Lake Superior Ingot Copper have been sold by the Lake companies to American manufacturers at 13 1/2 % lb, equal to £60. 12/6, net, per ton of 2240 lb. Imports of Copper (excluding Pyrites) from January 1 to date:

	1883.	1884.
Chili into Liverpool & Swansea	18,563	31,503
American into Liverpool and Swansea	5,548	11,447
Other countries into Liverpool & Swansea	19,497	18,631
Other countries into London	7,473	50,881
Chili into France	10,893	7,427
Other countries into France	8,280	14,175
Total tons fine	65,066	69,529
Deliveries into other countries tons fine	63,428	76,566

Quotations per cable from London this morning are £54. 2/6 for Chili Bars, and £58. 10/ for Best Selected. Spanish Copper Ore exportation during the first six months has been 325,325 tons, against 307,414 last year, and 314,482 in 1882; of Ingot Copper only 7830 tons, against 10,877 in 1883, and 11,021 in 1882. Manufacturers may be nominally quoted as under: Bottoms, 20 %; Braziers, 20 %; Sheathing, 18 %, and Bolt Copper, 20 %. We receive from London this afternoon the ensuing cable message: "Market a little steadier. Best Selected, £59 @ £60, and Chili Bars, £54 @ £54. 5/."

Tin.—Has become quite unsettled since London suddenly gave way this morning to £79. 2/6, spot, Straits, and £79. 7/6 three months, and at present brings 18 1/2 % in this market with difficulty on the spot. There were shipped from the Straits settlements to the United States in September 320 tons, to England 980, together 1300 tons; from Australia to this country 50 tons, and to England 800, together 850, making a total of September Tin shipments of 2150 tons. Meanwhile the deliveries in London have been 1690, and in Holland 500, together 2190 tons, out of which, however, 350 tons were transferred to the United States. The stock in Holland October 1 was 2870 tons, and afloat there were 820. The Banca sale at the close of last month averaged 49.37 1/2 guilders per 50 kg. Tin shipments from the Straits settlement to the United States during the first seven months have been 37,408 piculs, against 67,119 in 1883; 59,207 in 1882; 47,127 in 1881; 85,126 in 1880, and 56,065 in 1879. We are cabled from London this afternoon that the market is irregular, with Straits £79 @ £80, and futures £79. 10/ @ £80. 5/. Tin Plates.—The market continues dull and prices are easing off. We quote at the close, large lines, ordinary brands, per box: Charcoal Bright, \$5.50; do. Ternes, \$4.65 @ \$4.75; Coke Tin, \$4.70 @ \$4.85, and do. Ternes, \$4.37 1/2 @ \$4.50. Liverpool is easier, being anxious for orders. We quote Coke 15/ @ 15/3

and Charcoal 16/ @ 18/6. From London we are told there is no change to note.

Lead.—The only sale we hear of is one of 100 tons Common Domestic at 3 1/4 %. Refined has been offered at \$3.80. Western markets have also relapsed into a quiet mood. St. Louis quotes nominally Corroding, \$3.60 @ \$3.62 1/2, and Common, \$3.55 @ \$3.60. Soft Spanish has advanced 5/ per cwt. in London since yesterday, to £10. 15/. The floods in Spain and the cholera scare, which paralyzes everything on the Peninsula at present, and will probably do so during the remaining quarter of the year, hamper the movement in Lead thence to England and France, which would account for the advancing tendency of the London market.

Shipments from Spain First Six Months.

	1884.	1883.	1882.
Tons	Tons	Tons	Tons
Argenteiferous	31,038	21,889	27,761
Refined	31,139	33,989	39,756
Totals	62,177	61,868	59,517

Manufactures are quoted as follows: Lead Pipe, 5 1/4 % lb; Sheet Lead, 6 1/4 %; Tin-lined Lead Pipe, 15 %, and Block-Tin Pipe, 40 %, allowing in trade for Old Lead delivered in New York 32 % lb. Shot: Drop, 6 1/2 %; Buck, 7 1/2 %; Chilled, 7 1/2 %. Shot in 5-lb bags, 1 1/2 % lb extra. Bar Lead was advanced to date from 4 1/2 % to 4 3/4 %. From London we are told that the market is in the same condition as reported last week.

Spelter and Zinc.—Common Domestic Spelter has remained quiet at \$4.50 @ \$4.60, and Silesian at 5 %. Bertha Refined, 8 1/2 %. Sheet Zinc is in better supply at \$5.37 1/2 @ \$5.55, Domestic. Spanish Calamine exportation during the first six months has been 19,463 tons, against 20,762 and 17,651 in 1883 and 1882, respectively. Silesian was quoted this morning in the London market £14. 10/; we hear from there this afternoon that the market is a little steadier, without quotable change in price.

Antimony.—A fair trade has been done at 10 1/2 %, Cookson, and 10 1/4 % lb, Hallett. London cables the latter this morning unaltered at £41.

Coal.

The Anthracite Coal trade is perhaps a shade better than one week ago, but still very dull. The complaint is a plethora from overproduction, the occasional periods of suspension resorted to heretofore having failed to give the needed relief. It is fully demonstrated that the capacity of the mines is something like one-third above the ordinary demand for consumption. The talk about a further suspension has not yet reached a point warranting a public announcement. Reading professes indifference, although the company are believed to have in stock in Philadelphia not far from 100,000 tons. Under the circumstances, circulars of trade prices are worthless for present reference. Quotations range about as follows, free on board in New York: Stove, \$3.75 @ \$3.90, although sales have been made as low as \$3.50; Chestnut, \$3.40 @ \$3.65; Pea, \$2.50. The latter, however, or any of the low-grade steam sizes, may be had on buyers' terms, chiefly on account of the pressure of Bituminous Coal for like purposes. The latter is very quiet with sales of doubtful profit. Quotations are \$3.25 @ \$3.50. The Philadelphia Press says: "The Anthracite Coal trade of this State has been annually growing from bad to worse, and it is in a worse condition to-day than it has been since 1876, if not worse than it ever has been. There is practically no price for Coal, and, notwithstanding a supposed combination to control prices, it is more than probable that a purchaser of 10,000 tons or more might supply his wants at his own figures. The Coal wharves at Port Richmond, Elizabeth and other shipping points are crowded to the limit of their capacity. Empty vessels are lying idle off the wharves, begging for Coal freights at a mere fraction of former rates. Loaded Coal cars are crowded on every siding, with no room to deposit their freight, and the mines are thus driven to a forced suspension or curtailment of their capacity for produce by a scarcity of cars. This is not a flattering outlook for the trade, but it is the truth." The total amount of Anthracite mined thus far in the year 1884 is 20,258,482 tons, compared with 21,540,593 tons for the same period last year. The total amount of Bituminous sent to the Eastern markets thus far in the year 1884 is 3,908,066 tons, compared with 3,558,089 tons for the corresponding period last year—an increase of 343,977 tons.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	3.08 @
" light	.08 @ .08
Copper Bottoms	.08 @
Yellow Metal	.07 @
Brass, heavy	.06 1/2 @ .07
" light	.06 @
Composition, heavy	.06 @
Lead, heavy	.02 1/2 @
Tea Lead	.02 1/2 @
Zinc	.02 1/2 @ .02 1/2
Pewter, No. 1	.12 @
" No. 2	.08 @
Wrought Iron	per ton, 18.00 @
Light	10.00 @
Stove Plate Iron	10.00 @ 10.50
Machinery	13.00 @
Grate Bars	4.00 @
Stereotype Plates	.04 @
Electrotype	.03 1/2 @
Small Type	.05 @ .05 1/2

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	
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Trade Report.

Philadelphia.

Office of The Iron Age, 230 South Fourth St.,
Philadelphia, September 30, 1884.

Pig Iron.—The market has been very dull during the past 10 days, and a very depressed feeling prevails throughout the entire trade. The demand, which promised to be quite active during the early part of the month, has dropped off to the merest retail trade, with no immediate indication of anything beyond that. The falling off in consumption must be very serious, and the outlook for the fall trade anything but encouraging. It is not easy to account for this condition of affairs, although it is hoped and expected that, after the elections, business will become more active. Meanwhile there is an evident indisposition to enter into any extended engagements, so that purchases are limited to immediate requirements. The conditions are favorable for improvement, nevertheless, and, once the machinery is set in motion, there is strong probability that it will run with increasing momentum. So long as the elections are in doubt, however, inactivity is likely to be the prevailing feature. That matter settled, and backed up as it will be by abundant crops, it is difficult to see what can prevent a general improvement throughout the entire country. Prices may not advance materially, and with so much unemployed capacity it is not desirable that they should, but as orders become more plenty the tendency will naturally be toward remunerative figures. As regards stocks, the position is all that could be desired, producer and consumer alike carrying but very little. Production has also been restricted to the current requirements of the trade, so that there is not likely to be any accumulation to stand in the way of legitimate improvement when that time comes. Prices are fairly steady, but irregular, according to character of brand, quantity required, &c. Ordinarily, \$19.50 @ \$20 is quoted for No. 1 Foundry, delivered, and for standard brands these are firm quotations, but anything not strictly of that class has to be shaded more or less in order to secure a buyer. A few choice makes still command \$21, the supply being limited in proportion to the demand. No. 2 Foundry is dull and in liberal supply at \$18 @ \$18.50. Mill Irons are the weakest of all, and while \$17 @ \$17.50 is quoted for standard brands, these figures cannot be maintained in all cases, sales of good Irons being reported at \$16.50, with still lower prices on brands that are in the least "off quality." Taking the month as a whole, the close is not by any means what was expected, although sales have probably been somewhat in excess of the output, but the demand has fallen off and prospects are a little uncertain in regard to the near future.

Foreign Iron.—Business is very dull; nothing whatever doing in Bessemer, and only a languid kind of inquiry for Spiegel. Sellers ask \$32.50 for 30%, \$26.75 for 20%, and \$23 for 10 to 12%.

Muck Bars.—Demand only moderate, and, when large lots are taken, prices a shade easier. The usual rates are \$29 @ \$29.50, according to location of mill, although lower figures have been accepted on 1000-ton lots.

Blooms.—Market very quiet; small lots taken at the following quotations: Charcoal Blooms at \$52 @ \$53; Run-out Anthracite, \$43; Scrap Blooms, \$40; Northern Ore Blooms, \$38.

Bar Iron.—The market continues in the same depressed condition as noted a week ago. The demand is for small lots exclusively, and even orders of this kind are not numerous. It would be pleasant to say that there was a probability of early improvement, but at the moment there is really nothing upon which to predicate anticipations of that kind. Every one hopes for something better, and, as things cannot well be worse than they are, it is only a question of time for an improvement to take place. Prices are about as last quoted, say, 1.65¢ @ 1.75¢ for Common and Medium, and 1.85¢ @ 1.9¢ for Best Refined.

Plate and Tank Iron.—There is very little new business offering, and orders previously entered are now nearly completed. There is considerable anxiety to secure work to go on with, but offers for lots of any size are few and far between. Prices are down to rock bottom, and unless for something very desirable it would be difficult to obtain concessions, the asking rates being as follows: Plate Iron, 2.1¢; Tank, 2.15¢ @ 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—Business has been very disappointing to manufacturers, additions to their order books having been quite unimportant of late. There is a large amount of work in sight, probably upward of 50,000 tons all told, but when it will be given out is very uncertain. It may come in within a few weeks or it may not come for months; hence, it is impossible to depend upon it with anything like certainty. In the meantime about half or two-thirds of the mill capacity is kept moving, and from present appearances that is about all that can be expected for some time to come. Prices are about as last quoted—2.1¢ for Angles, 2.25¢ for Bridge Plate, 2.75¢ for T's and 3.5¢ for

Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—The demand keeps up very fairly, and prices, if anything, are a shade firmer, although not notably higher. Small lots of standard quality are quoted as follows: Best Refined, Nos. 26, 27 and 28, 4¢; Best Refined, Nos. 18 to 25, 3¢; Common, 1/2¢ less than the above. Best Bloom Sheets, Nos. 20 to 25, 6¢; Best Bloom Sheets, Nos. 16 to 21, 5¢; Common Red Plates, 3-16 to 16, 2¢; Best Bloom, Galvanized, discount, 20¢; Second quality, discount, 5¢; Common, discount, 5¢.

Wrought-Iron Pipe.—There is more inquiry and possibly more pipe selling, but altogether in small lots. Buyers appear to have everything their own way, and the market presents a very irregular appearance. Prices show no improvement, and it is increasingly difficult to discover a ruling price. Nominally the general discounts are as follows: Butt Welded Black Pipe, 45%; Butt-Welded Galvanized, 35%; Lap-Welded Black, 60%; Galvanized, 45%; Boiler Tubes, 57 1/2%.

Steel Rails.—The firmness noted during the past two or three weeks has been still further confirmed by the events of the past few days. A satisfactory amount of orders has been entered at gradually advancing prices, say \$27.50 as the average on the week's business. The inside quotation is now \$28 at mill, and, unless the date of delivery is favorable to the seller, orders are not easily placed at that figure. There are a good many orders to be placed yet, and the chances appear favorable for a gradual stiffening up to \$30, although, as stated, desirable orders are still taken at about \$28.

Steel Blooms.—There is a fair demand for small lots of Foreign at \$36.50 @ \$37.50 at tide, according to analysis. Domestic Slabs, \$37 @ \$38, delivered.

Crop Ends.—There is no inquiry at present, although bids of \$20.50 are solicited for West of England makes.

Old Rails.—The market remains in the same unsettled condition as reported a week ago. Spot lots, Philadelphia, are held at \$18.50 @ \$19, but consumers appear to do better at points offering better deliveries. Sales have been made at \$18.50 @ \$19 on line of roads in the interior, and about \$17.50 @ \$18 is bid for seaboard lots.

Scrap Iron.—Market dull and prices a shade lower. Selected No. 1 can be had at \$19.50 @ \$20, f.o.b. cars, and cargo lots at \$18 @ \$18.50, but the demand is very limited. Machinery Scrap and Wrought Turnings held at \$15 @ \$15.50, and Cast Turnings at \$9 @ \$10.

Nails.—The usual fall trade is approaching, and dealers find it necessary to increase their stocks. The demand, therefore, is slightly better. Steel Nails especially are in increased demand, and, while the price is nominally \$2.20, they are freely sold at a trifle more than Iron Nails, which remain at \$2.10 @ \$2.20, as last quoted, although lower prices are rumored, but not confirmed.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., September 30, 1884.

There has been no material change in the general Iron situation during the past week; business continues dull, and is exceedingly unsatisfactory. One of the best-informed operators remarked last evening that in all his experience he never knew the Iron business to be any worse, and that he could see no indication of any improvement until after the Presidential election, and that he does not look for much of a change for the better until next spring. The demand for everything in the Iron line continues of a hand-to-mouth character, and with an active competition prices are being cut so very close that there is scarcely any margin for profit. Some furnace and mill owners are making little or no effort to get business, having arrived at the conclusion that it is better to do nothing than to work for nothing. There is no disputing the fact that rolling-mill and blast-furnace property is at a heavy discount. A great many who have their capital locked up in property of this character would like to sell, but in the present condition of affairs there are but very few buyers. The recent rains have had a good effect in many ways; in addition to relieving the pasture, which was almost burned out, the wheat recently sown will be started up, and the farmers thereby relieved of a good deal of anxiety. In some sections of the country the drought held out for over two months, and in some parts of Washington County farmers had to haul water from the Monongahela River for their live stock, and a good many sheep and cattle are reported as having perished for want of water. With the drought ended and the Presidential election over, it is hoped that an end to the hard times, about which we hear so much, will soon follow.

Iron Ore.—The Ore trade continues very much depressed, and what is still worse is the fact that there is but little prospect of any immediate improvement. Some of the Lake Superior Ore companies still have unfilled contracts made last winter and spring, but certain it is there have been very few contracts made for some time past, and, in view of the large number of idle furnaces, it is very evident that the demand will continue light during the remainder of the present year.

Pig Iron.—There has been little change in the market here during the past week; consumers are still adhering closely to the hand-to-mouth policy, buying only as their immediate actual necessities require, and, while producers are anxious to sell, they are refusing to make any further concessions in price in order to effect sales. The last of the Iron of the bankrupt Manchester Furnace Company, it is understood, has been closed out, but there is still a good deal of the Marshall Iron on hand, although the most of it is in strong hands, being owned by banks and insurance companies, and will not be put on the market until they can get their money out of the same. Some of the Iron in question, if sold at present prices, would lose the owners a good deal of money, and it will be some time, therefore, before it is offered for sale, as the present owners will hold for a better market, instead of trying to close out now at a serious loss; besides, it is doubtful if buyers could be found now, even if an attempt were made to force the same. Production continues light and stocks are not accumulating, as the few furnaces in blast have contracts absorbing their entire output, and if there should happen to be an increased demand the market would soon stiffen; but of this the prospect is not very promising at the present writing. Prices remain as quoted a week ago:

Neutral Gray Forge.....\$16.00 @ \$16.50, 4 mos.
All-Over Mill.....17.50 @ 18.00, 4 "
White and Mottled.....15.00 @ 15.50, 4 "
No. 2 Foundry.....16.50 @ 17.50, 4 "
No. 1 Foundry.....19.00 @ 20.00, 4 "
Cold-Blast Charcoal.....25.00 @ 26.00, 4 "
Warm-Blast Charcoal.....21.00 @ 23.50, 4 "
Bessemer Iron.....18.50 @ 19.00, 4 "

Muck Bar.—Sales have been made as low as \$28, cash, but sellers generally are asking \$29.

Manufactured Iron.—Trade in all branches of Finished Iron continues very dull; while the most of the mills are running, but few, if any, are working full. Some are standing idle. Orders continue to come forward very sparingly, and are nearly all small. Both jobbers and consumers are buying as their immediate necessities require, and the indications are that this policy will be closely adhered to during the remainder of the present year. We continue to quote prices on a basis of 1.65¢ @ 1.75¢, 60 days, 2¢ off for cash, for Bars—that is, for a good quality of Iron, and a good many buyers prefer to pay a little more to taking the chances on poor stock, which nearly always renders more or less dissatisfaction.

Nails.—There has been no improvement in the situation during the past week; business continues very dull for the season, and prices are unsettled and unremunerative. We continue to quote at \$2, 60 days, 2¢ off for cash, in car lots, although it is rumored that sales have been made below the price quoted; job lots, 5¢ @ 10¢ per keg additional. Schoenberger & Co. have commenced to make Steel Nails, which some people think are destined to supersede Iron Nails in the near future.

Wrought-Iron Pipe.—The demand appears to have fallen off within the past week, and, while the mills are still fairly employed, there is not as much new business in sight as there was a few weeks ago. Byers & Co., of this city, and Crane & Co., of Chicago, have reissued the old price list, and it is probable that others will do likewise. It is rumored that a meeting of all the Pipe manufacturers will convene in this city shortly, and, if so, an entirely new list will probably be adopted. We continue to quote prices same as a week ago: Discount on Black Butt-Welded Pipe, 40%; on Galvanized do., 30%; on Black Lap-Welded, 60%; do. Galvanized, 40%; discounts on Boiler Tubes, 52 1/2% @ 57 1/2%; 2-inch Oil-Well Tubing, 12¢ per foot, net; 5 1/2-inch Oil-Well Casing, 40¢ per foot, net.

Old Rails.—Continue dull, and in the absence of sales we continue to quote as a week ago, \$19.50 @ \$20. Demand light; largest consumers appear to be pretty well supplied.

Steel Rails.—We continue to quote Heavy Sections at \$27 @ \$28, cash, at mill. Reports have reached here from the East within the past week of the market having stiffened there, and a rumor prevails of a syndicate having been formed to buy up all the Steel Rails that can be obtained at present prices.

Railway Track Supplies.—The market for everything in this line continues exceedingly dull, and there is not much prospect of an early change for the better. Prices are nominally unchanged. Spikes, 2.35¢, 30 days; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2 1/2¢ @ 2 3/4¢.

Steel.—There is a fair demand for Merchant Steel, but prices as a rule are reported unsatisfactory. Standard brands Refined Cast Steel, 9 1/4¢ @ 10¢; Crucible Machinery, 5¢ @ 5 1/2¢; Open-Hearth and Bessemer do., 4¢ @ 4 1/4¢. Steel Slabs for making Nails have commenced to be quite a feature in the Steel business.

Crop Ends.—American Steel Rail Ends are still quoted at \$18 @ \$18.25, cash.

Scrap.—The Scrap trade continues very dull, and prices are so weak and unsettled that it is difficult to quote correctly. No. 1 Wrought is nominal at \$18 @ \$19 per net ton; Wrought Turnings, \$15 @ \$16; Old Car Axles, \$25 @ \$26; Cast Boring, \$12 @ \$12.50, gross; Old Car Wheels, \$16.50 @ \$17, gross.

Window Glass.—Trade continues quiet for the season, while prices remain unchanged. Discount on Single Strength, in car lots, 60 and 20%; on Double Strength, 70 and 10%.

Coke.—There is no improvement to note either in demand or price, nor is it likely that there will be soon. The combination price on blast-furnace Coke remains unchanged at \$1.10 per ton, free on cars at ovens.

Chicago.

Office of The Iron Age, 36 and 38 Clark St.,
Cor. Lake St., Chicago, September 29, 1884.

Hardware.—The Hardware trade continues to be very active. The business for the past week was fully up to that of the previous one, and jobbers are several days behind their orders. There is a steadiness in mail orders which forcibly marks the feeling of confidence among retailers. They no longer wait for a traveling man in order to get the lowest price, nor do they write to the house for quotations in advance of placing their orders, but send them in with instructions to supply the articles at the best figures. Jobbers at the same time are careful to do the best for their customers that is possible. Competition for trade is strong, and the retailer can always learn from an agent of an opposing house whether he has been well treated or not, and this check has much to do with some of the very low prices which prevail. The present demand consists largely of winter goods, such as Stove Boards, Coal Hods, Hollow-Ware, Stove-Pipe and Builders' Hardware, carpenters' Tools, &c, there being more than a fair demand for the latter, considering the season. In the way of sales, business is entirely satisfactory. There is no change in prices that calls for special mention. Collections are reported slower than for the month of August.

Barb Wire.—The condition of the market for Barb Wire has not undergone any change within the last week or 10 days. Buying, which continues to be of a limited character, is for consumption, so far as can be learned, and the demand not much better than at the opening of the month. While the opinion still prevails that Barb Wire is a good investment at present figures, there are few buyers of large lots. Small trade is steady, and carload lots are quoted at 5 1/4¢ for Galvanized and 4 1/4¢ for Painted.

Nails.—There is a fair demand for Nails in small lots, which are now quoted at \$2.20. Carload trade is not active, though some sales are made. The ruling price for good Nails in car lots is \$2.15, 2¢, 60 days, but sales are reported at a shade less without contradiction. Some of the mills whose stock was pretty well exhausted have started up again, and from all appearances will continue to make Nails at whatever price can be obtained. There is no indication that Nails will settle to a permanent price before the close of the fall trade. The margin in price is not infrequently governed more by what profit there is in the balance of the order than by the cost of the Nails. The irregularity in price has greatly demoralized the market.

American Pig Iron.—As consumption is looked upon as being the basis from which must come the long-looked-for improvement in price and demand for Pig Iron, this market is one of the first to experience any change when it occurs. The Pig Iron that is sold in this market goes direct into the agricultural territory in the shape of implements and machinery. The abundant harvest gives promise of an increased expenditure for improvements and extensions in various directions. The Pig-Iron makers are now beginning to feel the influence of these conditions of the country, and are withdrawing their low prices, which were given as "specials," and demanding that quotations be met by consumers. The States of Michigan and Wisconsin have 28 furnaces. Out of this number 10 are now in blast, and three of these will be blown out as soon as their present supply of Ore is exhausted, which will likely be within the next 60 days. The cessation of these furnaces will withdraw from the market about 3500 tons per month. Most of the furnaces that are in blast have sold all that they are willing to dispose of on contract, and now are desirous of selling for delivery beyond January 1. Trade on prompt delivery in carload lots is fairly active, and in a general way the market is more favorable than it has been within the past year. The price of Lake Superior Charcoal has been advanced to \$21.50, four months, as bottom for the lower grades, which means that the inside figures are being dropped and that quotations are to be strictly adhered to. A 300-ton order was refused during the week at \$20.50, cash, for Lake Superior Charcoal, and an order for Southern was refused at \$17, cash. It is true, however, that the prices which were refused would have been accepted for other brands, which would have been an advance of from 50¢ to \$1 per ton on an Iron of much inferior grade. The tonnage for the month has been far in advance of that for August, and yet there are a number of contractors who are taking their supply in car lots who usually arrange for the year during September. Some of these cannot now buy a year's supply, while others are desirous of taking their chances. For present delivery we make the following quotations on carload lots, four months: Lake Superior Charcoal, Nos. 1, 2 and 3, \$21.50; Nos. 4, 5 and 6 at \$22; Lake Superior Coke at \$20; Lake Superior and Ohio, mixed, at \$20 @ \$21; Ohio Standard Black Band, No. 1, at \$21; Southern, No. 1, at \$18; No. 2 at \$17.50; Sil-

very Soft at \$17.50 @ \$19.50; Anthracite, No. 1, at \$21, and No. 2 at \$20.

Scotch Iron.—The interest in Scotch Iron has waned within the past two weeks. There is a fair demand in a small way, which is supplied at the following quotations: Summerlee, \$25.50, cash, from yard, and \$24.50 to arrive; Glengarnock, \$25.50 from yard, and \$24 to arrive.

Merchant Steel.—The Steel market, it appears, has no interest in common with that of any other Iron product. The only favorable feature in the trade is the continuation of a demand for Steel of some grade. This grade is determined by the price the consumer must pay. An irregular and distracted market gives opportunity for severe cutting. Agents acknowledge that prices are so badly disturbed that they are afraid to make a price or speak of those they hear. The demand for specials is the best part of the trade, and less conflicting in price. Some of the mills who now largely use this class of stock report that they are well supplied with work, while in a general way makers are not overbusy. For Refined grades from store we make the following quotations:

Per pound.
Best Refined Cast Tool Steel.....8 1/2¢ @ 10¢
Crucible Cast Machinery Steel.....6 @ 6 1/4¢
Open-Hearth and Bessemer Steel.....8 @ 8 1/4¢
Open-Hearth Spring Steel.....3 1/4¢ @ 3 1/2¢
Tee-Calk Steel.....3 1/4¢ @ 3 1/2¢
Fire-Box and Boiler Steel.....4 1/2¢ @ 5¢
Syndicate Steel.....7 @ 7 1/4¢

Steel Rails.—The Steel-Rail market during the week was more active than the preceding one. We hear of sales aggregating between 30,000 and 40,000 tons, which are said to have been made at about \$30, Chicago delivery. From what can be learned, mills that are not running are idle more from choice than necessity. Inquiries are numerous and contracts are seeking makers, but makers are of the impression that delay will bring them better figures. While there has not been an actual advance, the market is stronger, and less disposition to make concessions is shown. Reports have been circulated that Rails have advanced \$1 per ton. This cannot be regarded as a fact so long as it is impossible to establish a minimum price for the present demand. Makers have not yet arrived at the point where they will be quoted as saying definitely one thing or the other.

Old Rails.—Transactions in Old Rails were more limited during the week past, but the market is firmer. Several lots aggregating about 2000 tons were sold at \$19, it is said, though mills are bidding for \$17.50 to \$18.50, according to quality. Holders are not willing to sell at these figures, as a rule, and when there is a demand for small lots that is urgent they realize from 50¢ to \$1 per ton more than they would otherwise command.

Structural Iron.—While the building season is now well advanced and the summer contracts well under way, there is a good demand for Structural Iron. One of the prominent houses in this line of business report contracts enough on hand to give them work all winter. Some of these are for delivery late in the fall, and part for early spring. There are other makers who have not been so fortunate, and complain that the season will soon be at an end. We continue to follow quotations, with 1/4¢ @ 1/2¢ added for delivery from stock: Beams, \$3.60; Channels, \$3.60; T Iron, \$3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70.

Bar Iron.—There was no change in the Bar-Iron market during the week. Trade continues fairly active in small lots, and prices the same as heretofore. For Best Refined New Puddled Iron, \$1.85 @ \$1.90 is quoted from store, and \$1.70 @ \$1.80 for Common. Mills making Common Iron find it difficult to dispose of their product at times, and frequently accept very low prices to relieve the pressure.

Norway Bars.—No change to report in Imported Iron. Merchant price is \$3.75 and consumers 4¢ rates, except in some special cases where small lots have been sold for less.

Galvanized Iron.—The demand for Galvanized Iron continues very steady for the season and trade may be regarded as fairly good. Some of the makers of Galvanized Iron are not in the ring on prices, and for some time back circumstances created a suspicion that a slight cut was being made somewhere. In order to hold the syndicate together and sustain their combination, an extra 2 1/4¢ was added to the discount, which increases jobbers' discount to the trade as follows: Juniata, 55¢ off; Charcoal, 57¢ off, and Refined, 60¢ off. It is reported that the syndicate will meet every cut that comes to their knowledge, and that it is their intention to firmly support the present arrangement, which is said to be entirely satisfactory.

Black Sheets.—There are conflicting statements made regarding the condition of the Black Sheet market. Jobbers are of the opinion that makers are less firm than a week ago, and that their chances of obtaining a stock next month to carry them through the winter are decidedly better. Manufacturers claim that they have named their best figure, and do not intend making further concessions. Odd sizes are taken by jobbers without contention, but on the low grades, for Stove-Pipe, they have a larger option in price and quality. While the market is active in a small way, there is not much buying that runs into money. Jobbers have no desire to sell in quantity, and avoid doing so as much as possible. We make the following quotations from store: Nos. 10 to 14 at \$2.60 @ \$2.70; No. 24 at

Trade Report.

General Hardware.

Trade moves sluggishly, without special features other than those which have thus far characterized the season's business. Buyers are not purchasing more goods than their immediate trade demands. But few are in this market, the business being transacted almost entirely by orders sent through the mail or intrusted to travelers, of whom a great many are on the road, diligently picking up what business they can. Reports indicate throughout the country a general depression, which is probably more prevalent in the Western than in the Eastern States. Prices do not show signs of improving, being in nearly all leading lines unsettled and weak. It is a time in which manufacturers will be wise in not accumulating goods, nor forcing them on the market by too extensive concessions in price, and merchants will serve their interests by careful buying of such goods as they need. Collections are fair, the country dealers in most cases paying bills promptly.

BARB WIRE.

New business is even less abundant now than it has been, but the local factories report a fair amount of orders yet on hand to be filled. A movement is on foot to improve the condition of the Barb Wire market by forming a syndicate to regulate prices. A meeting of manufacturers representing different sections of the country was held at Chicago on the 26th ult., but nothing definite was accomplished, owing to the non-representation of a considerable number of the licensees. An adjourned meeting was to be held this week to receive reports from committees which were appointed to devise some plan by which to accomplish the purposes stated. Prices still continue unremunerative, as may be expected under the circumstances. They are reported on the basis of 5½ to 5¾ cents for Galvanized Four-Point, according to quantity, Painted being 1 cent per pound cheaper.

NAILS.

The condition of trade continues to be very good, so far as the demand is concerned, quite a heavy buying movement being in progress. Indeed, the demand continues so good that no warehouse in this vicinity now contains large stocks. Some heavy orders have been placed during the past week, and we note the withdrawal from the market, at least temporarily, of some factories which were recently anxious sellers at low prices. They have apparently received all the orders they care about filling at low rates, and will now hold off for a time, in the expectation that prices will improve. The export demand is still fairly good, though orders are for small lots, a call for a large lot being exceptional. Our statement last week concerning the shutting down of the Bridgewater Iron Company's Nail factory was based upon imperfect information. We have since ascertained that they have temporarily shut down only a portion of their machines, owing to the low prices now ruling, but they will continue in operation the remainder of their machinery and will continue for the present to carry a full supply of goods. The prices quoted by the various agents in this city are now somewhat irregular. Some of the companies making brands of Nails which are regarded as favorites are asking from 5 to 10 cents per keg more than other companies whose Nails do not stand so well. Our quotation covering the range of prices, owing to these circumstances, is from \$2.15 to \$2.25 for ordinary deliveries from store, concessions for large quantities from this figure being the exception rather than the rule. The feeling is, in consequence, somewhat firmer than was the case 10 days ago.

STEEL SHAPES.

It will be remembered that a few months ago we announced the formation of the Association of the Steel Plow and Blade Manufacturers, for the purpose of regulating the prices of Steel Finished Shapes. At that time prices were determined upon at an advance on the low figures that prevailed last year; but we learn that the prices agreed upon have been already departed from, and that the goods are now sold again at very low figures.

CARRIAGE BOLTS.

It reported that the market in Carriage Bolts is again weak, and that the prices agreed upon by the manufacturers have been undersold to such an extent that lower quotations must be made for large lots.

MISCELLANEOUS PRICES.

The American Machine Company, of Philadelphia, request us to say that their price to the regular retail trade for their Perfection Scales, which were described in last week's *Iron Age*, is discount 10 per cent.

Among the Hardware Novelties on page 39, will be found West's Patent Steel-Wire Ice Creeper, made by C. F. West, 1940 Columbia avenue, Philadelphia, and for the sale of which Sise, Gibson & Co. are agents in this city. This article is sold at \$3 per dozen pairs, subject to a discount of 33½ per cent.

The price of Frost's Patent Thill Spring, manufactured by Stiles Frost, 276 Devonshire street, Boston, and illustrated in his advertisement on page 52, is \$1.25 per dozen pairs.

CUTTING PRICES.

We have again to acknowledge the receipt of a number of communications from the trade in different parts of the country concerning the prevailing cutting of prices. The merchants have had the benefit of the views of manufacturers on this question, and our correspondents nearly all refer to the interest with which they have read the letters which have appeared in our columns. The dealers then having been informed how the matter looks from the manufacturers' standpoint, the manufacturers, we are sure, will be glad to see the subject from the point of view occupied by the dealers. It is indeed not unlikely that some of the communications which have come to us, and which we take pleasure in laying before our readers, will be of special interest to manufacturers, advising them just how the thing is done, and the extent to which it is carried. It will also certainly be of general interest to the trade, as opening up a subject which demands attention, and throwing light upon the prevailing practice, which has very many evils connected with it. What the outcome of the matter is to be we do not presume to say, not caring at this stage of the discussion to venture a conjecture as to which of the results that have been alluded to is the most likely to occur—the adoption by manufacturers of substantially one price to the trade, large or small; the restriction of production by the manufacturers, and closer adherence to regular prices on the part of jobbers; the abolition of the jobbing system; the formation of solid combinations of manufacturers by which prices will be maintained, or any of the many other remedies or results which our correspondents have suggested. We are content to bring the fact before our readers in such a way that all may understand the situation and determine upon the course which is most conducive to their interests and the good of the trade at large.

It would be satisfactory if we could report that prices are beginning to stiffen, owing to cessation of the cutting, which makes them on many lines to close buyers largely nominal; but the fact, we regret to say, is that prices on many lines are exceedingly weak, and manufacturers and jobbers are apparently as eager as ever to force sales. Buyers are, however, holding off, as heretofore, and many of our correspondents indicate by the way in which they write that, no matter how low they buy the goods, they have a feeling of uncertainty as to whether they have reached bottom or gone as near to it as they might have gone. It is agreed on all hands that the present condition of prices is unsatisfactory, not only in the narrow margins of profit which are left for the manufacturer, and, indeed, for the jobber as well, but also in the effect which this unsettled condition of prices has in preventing merchants from placing their orders. The present situation is illustrating the reluctance which is always felt to buy on a falling market. This cutting of prices has then, undoubtedly, a great deal to do with the present stagnation in Hardware, and manufacturers will do well to consider the necessity for preventing a continued demoralization of prices, so that trade be not constantly interfered with in this way.

But, turning to the correspondence at hand, we select from the letters we have received the following, which comes from a New England Hardware house. It does not refer to as extensive cutting of prices as many of our correspondents, but its careful, accurate statement will be of service to our readers as forming their judgment upon the whole question:

We have read with interest the discussion in *The Iron Age* in regard to the cutting of prices. We think this a hard matter to solve. We buy a large quantity of goods of jobbers in your city, for the reason that we can buy for less than of the manufacturers. We do not think this the correct way of doing business, but it is natural for most of us to buy where we can buy the lowest, and we see no way out of this trouble so long as manufacturers continue to sell to jobbers at the prices they do. This matter indeed, however, is not confined to jobbers, but cutting in the same manner is working among retail dealers in reaching out for more trade; and we suppose so long as goods are bought and sold that each dealer has perfect right to sell his goods at such a price as he thinks best. We do not experience much trouble with manufacturers giving low prices on small orders, but, of course, it is done to a certain extent, and on certain lines it is followed up. This we think is wrong, but there is a great difference in the manufacturers. Some have a little principle and wish to do business in a fair way, while others will do almost anything to get trade. If they cannot sell the trade they will sell to consumers at about trade price. We hope this question will be solved and put right, and shall follow up the discussion that has commenced.

There is, as our readers have observed, some difference of opinion as to whether the manufacturers are going as far as the jobbers in the cutting of prices. Some of our correspondents intimate that it is about six of one and half a dozen of the other, but others are of the opinion that the jobbers are the first and principal cutters, the manufacturers, in self-defense, being compelled to follow suit. One responsible house writes us, expressing a view about which there can be but little doubt, that the cutting of prices is caused by overproduction and too much anxiety, both of jobbers and manufacturers, to unload, and adding that they buy for the most part direct from manufacturers, and find them ready at any time to cut prices. In illustration of this, they mention an ex-

ceedingly low figure at which leading combination goods were purchased within a short time and in a small quantity.

The letters to which we have thus far referred are from Eastern merchants, but now, taking up one from the far West, we find our correspondent expressing the opinion that manufacturers are more to blame than the jobbers, our correspondent mentioning that his experience is that the manufacturers are endeavoring to secure the trade of that section, and giving the names of several who have canvassed the ground and placed goods at prices that are materially below the regular figures. Mentioning a certain line of goods, the writer advises us that the jobbers have been selling them at Omaha and St. Joseph at discount 60 per cent., but the manufacturers deliver them at the Missouri River at discount 60 and 20 per cent., adding that in his town the manufacturers sell them direct to the retailer at about these figures. He then goes on to say:

I have read the discussions in your paper right along, and see the different ideas expressed, and have come to the conclusion that this discussion will wake the manufacturers up to see where they are drifting to; for if this keeps up, it will in course of time bar the jobber out. I have found that the cutting has been so great that if a merchant says, "Here is your money if you will let me have the goods at a certain price," there is very little danger of the offer being refused, if it was only the cost of the material. Why this is done I cannot see. I fear it will result in some large concerns breaking down at some time in the near future, as they cannot sell goods at cost of material and live.

The following letter is from a house in Kansas, and will be read with interest:

We presume that the cause of the cutting is that different jobbers have stocks that they are willing to sell at prices below cost; for example, one house has an overstock of —, and to reduce the same will sell at discount 50 and 10. Jobbing houses buy large quantities to get close prices (at manufacturers' cost), and, after holding for some time, sell in small quantities at or near the same figure, to reduce their large stock, thinking they can make a leader of that special article. Another house or its representative comes along and sells a bill; he has to meet this price. Thereby hangs the wolf's tail. The second party has a leader which he sells at special figures, and other houses have to meet his prices, &c. In this manner prices of articles are reduced, and finally they are sold for less than cost. Manufacturers are following the idea of the railroads, and forming pools. Then look out for No. 1. We think that goods will depreciate still more until the great crops have been marketed. Farmers in the West are holding their wheat for better prices, and are not buying, and if they do buy they want to give notes at high interest. This also influences merchants who carry this kind of paper. Again, prices of many articles of Hardware have been watered; the lists have gone up from time to time, until at last they are away out of reach. Take Door Bolts, for example. The list for 3-inch is \$2 per dozen. In quantities they are sold at 50 cents per dozen. This we call watered. You understand the matter, but some country merchants do not.

From a confidential letter giving an inside view of how matters in this regard are in the vicinity of Chicago, we are permitted to give the following extract, leaving, however, the names which are mentioned blank, as their publication might be embarrassing to some of our esteemed friends:

The fact is, we do not know when we are buying cheap. We think the jobbers are largely to blame for cutting in prices. We retailers buy as cheap as we can, and in some instances force the jobber to come down. Why? Because the Hardware business is so divided, and jobbers sell to so many outside of the trade, that we must have inside prices to hold our own. In our town of less than 10,000 inhabitants we have more than 20 firms selling Cutlery, Shears, Razors, &c., comprising drug, confectionery, book, grocery and dry goods stores. Then again you find Shovels, Spades, Axes, Scythes, Tacks, &c., in every grocery store; Locks, Butts, Blind Butts, Door Springs, Sash Cord, Screws, &c., are in all sash factories and lumber yards. Picture Nails, Drawer Pulls, Casters, Drawer and Till Locks can be found in every furnishing store, and so on. Again, a house such as — (of Chicago), who caters to the blacksmith trade, will send their man here and drum the smiths—giving them low prices—parties that we have to carry on our books for a year. We soon get on to —'s prices, and when — & —'s man comes around we offer him a certain price for goods, and rather than go away without an order he sells. From that time on that becomes the established price, for, when the agent of another house comes, we tell him we bought at such a price a month ago, and we ask him to go one better. He comes down; so the good work goes on. Another instance: — & Co. sent a circular September 10 broadcast over the country, even to the very smallest trade, quoting prices away down. A few days afterward —'s man (naming a large jobbing house) comes here with instructions to go 5 per cent. better on all goods quoted by — & Co. Well, next day after, the representative of a large Eastern jobbing house calls on us, and as we want to buy some goods he gives us some prices. We tell him to hold on; he is too high, and show him — & Co.'s prices, and tell him we can buy 5 per cent. better without going East, and that if he will go one better again, so as to pay for difference in freight, we will buy of him. He says he can sell as cheap as anybody, and the consequence is we buy goods very low. Now, are we to blame or is the jobber? — & Co. (who sent out the circular referred to above) have made a price for the small trade, and we that buy 10 times the quantity must buy lower and can always do it. Again, the — Company's man will come here, and tell us he will sell us as cheap

as he does to jobbers, and will give us the same low figures on the same goods. We buy them, and the next jobber who appears will have to sell at the same figures. Between the two, the manufacturers and the jobbers, a retailer can generally buy cheap without doing anything or misrepresentation. We have given you facts that have come to our notice in the past two weeks.

It is not a pleasant duty to have to lay these unwholesome facts before the trade, but it is certainly for the benefit of all concerned to have the matter ventilated. Under this condition of things, some of the manufacturers who have not succeeded in placing the usual quantity of goods on the market may learn something of the influences that have interfered. The information which is thus furnished, and the views of the trade regarding these matters, will be of special value to manufacturers who are sagacious, and ready to adopt a policy adapted to the changing circumstances of trade.

Concerning the causes and possible remedies we have received several letters. From the first of these, which is from a Southern Hardware house, we make this extract:

We think the trouble about cutting prices can be regulated if the manufacturers want it regulated. As long as they leave the way open by quoting extra discounts to large jobbers and deliver goods, just so long will the trouble exist. The large jobber wants to run his smaller competitors off the track, and gives away his extra as a bait. If the manufacturers will make it a rule to name no larger difference than 10 per cent. between their jobbing price and their price to retailers they will soon stop the cutting; but when it comes to having a difference of from 25 to 35 per cent. for the benefit of jobbers they must expect to have the price they name cut, and that the retailer shall be enabled to get prices much lower than those at which the same goods can be bought at factory. For our part, we are able to look on and laugh, for cash will buy at his own price when there is the overproduction which now exists. We dislike to see, however, the present state of the market, and hope to see a moderate advance in prices after the November Presidential election.

In the following clear and judicious letter, an Iowa Hardware house comes to the defense of the travelers, who are made by some to bear more than their share of the blame. Our correspondents also give their view of the general features of the situation, failing, however, as so many have failed before them, to suggest any immediate remedy. Matters, in their judgment, will have to take their natural course; but the question remains, What is the natural course, and especially what are the manufacturers, who have made prices to the jobbers and must still make them, going to do about it?

To the Editor of *The Iron Age*: It is really amusing to notice the difference of opinions in regard to who is to blame for the demoralized condition of trade by the cutting of prices. Many choose to lay it at the door of the "traveling man;" he is the entire cause. Now, in our opinion, he is not to blame at all; it is true there are exceptions, though, generally speaking, the traveling man does just as the house directs him to do. Every "traveler" goes into the "field" with his instructions from "the house," which, of course, vary as the case may be, though there is one instruction given him in particular, and we will venture to say ninety-nine out of every one hundred houses give it, and that is, "meet legitimate competition." Now there is where the great trouble lies. What is legitimate competition? It has been our experience, when wanting an especial low price on any thing in particular, that we could always get a better price from the house than from the agent, notwithstanding the fact that it is the agent that is to blame for cutting prices. Though enough for this. Now, what do we all mean by "cutting of prices?" These words evidently cut deep on our imaginations, owing to their keenness in appearance and sound, though they are nothing more than hard times and overproduction boiled down, and seasoned with close competition. Let better times prevail, and you will hear nothing said of cutting prices. It is true there are some goods sold at ruinously low prices, in some cases probably at a loss, though, take it as a whole, a fair margin is realized; so what better are they to expect. Of course it is natural for more or less complaint, and something must be called cutting prices, yet no one seems to think they are the cause, nor are they to blame. The only remedy we can see is, as has already been stated, leave matters take their natural course. While the overproduction of merchandise is great, the overproduction of merchants is still greater, and with these two elements to contend with, what more can be expected?

The letter which we give below will also be read with interest, as suggesting a method of disposing of goods which in some lines would probably work successfully, and, if carried out, prevent the cutting of prices, which all regret:

To the Editor of *The Iron Age*: We have noticed with interest the discussion in your columns on "cutting prices," since we have felt its evils and so far have found no satisfactory remedy. Of the remedies suggested by your correspondents, but two seem to be practically in the hands of the manufacturer, viz., either sell no jobbers or no one but jobbers. Of the two we prefer the former, since by means of travelers we can reach most of the desirable retail trade, but it necessitates establishing branch houses or distributing depots at various sections of the country, since retail trade in distant sections dislikes to wait for goods to be shipped direct from the factory, and freight rates are too high in small lots. By establishing distributing depots in central points railroad freights can be obtained that far, and much time saved in delivering goods. The manufacturer, however, cannot in most cases get at all the jobbers' trade without too large a force of travelers, and we are about to try the following plan, viz.:—sell to jobbers

only where we can give them territory, and confine them to it. In sections where we have worked up the trade to such a point that we have agents at most of the desirable points we shall refuse jobbers' trade. At all other points we shall sell no one but jobbers and turn our trade over to them. Each jobber will be given certain territory, and understand that as soon as he solicits trade outside of it his agency will be taken away from him. Jobbers will be given a reasonable amount of territory, and in this way we hope to do away with cutting prices, as jobbers will see no necessity for it if they are sure of getting all their natural trade. Where we sell retailers only, we can, of course, control prices. We shall be glad to hear criticisms.

The following letter is from a house which has recently adopted the policy of dispensing with discounts to jobbers, and making a substantially uniform price to the general trade, as stated below:

To the Editor of *The Iron Age*: We have read with deep interest the many articles in reference to cutting of prices by jobbers. We offer as the only remedy the manner in which we transact our business. We sell at bottom net prices, in quantities less than \$1000, at open and above board quoted figures, and no man can buy from us at a fraction of a cent less. This we find has opened up a trade with all sections of the United States and Canada, and the trade throughout the country second our efforts by sending in orders at once, knowing that those are our best and only prices. We feel confident that the manufacturers throughout the country will find it to their interest to adopt this method of doing business. It will stop cutting at once, and "the best horse will leap the ditch" or get the best trade. We have more than our share, and we would be pleased to have others in the same position.

But here we leave the matter till our next issue, reminding our readers, manufacturers, retailers and jobbers that we shall be glad to hear from them further on the subject, with facts or suggestions which will aid to an understanding or improvement of the methods of trade.

ARRANGEMENT OF STORES.

We have received the following inquiry from a Hardware man, with reference to the arrangement of Hardware stores, a subject which was brought to the attention of our readers in a communication published a few weeks ago, concerning which we have not, however, received any replies from the trade. Cannot some of our subscribers give our correspondent some suggestions upon this subject? The letter at hand is as follows:

To the Editor of *The Iron Age*: I observed an article in *The Iron Age* referring to the arrangement of Hardware stores. I have a retail Hardware store in Philadelphia, and am going to move in a short time. Although I have been in business 14 years, I do not know how to go about fixing my new store so as to make things new and attractive. I do a good business now and hope to do more when I get in my new location, but my great difficulty is with reference to my shelves. How deep ought they to be, and how high, for general Shelf Hardware, and also what size wooden boxes will be most convenient for use? If you could give me any information on this subject you would oblige a reader of your paper.

HARDWARE MAN.

TOOL CHESTS.

In the description which was given last week of the Handy Tool Chests, just put on the market by the American Tool Company, an error occurred by which the width of No. 1266 was stated to be 25 inches, instead of 7 inches, the 25 inches being the length. By a similar blunder Chest No. 1269 was stated to be 26¼ inches wide, when it should have been 26¼ inches long and 7 inches wide. With these corrected figures the special feature of these Handy Tool Chests is manifest, inasmuch as they are long, narrow Chests, permitting a longer Saw than has usually been furnished in similar lines.

THE WIRE GOODS COMPANY.

Arthur W. Parmelee, who for many years has occupied a responsible position with Sargent & Co. at their works in New Haven, has, we learn, tendered his resignation, having been elected to the presidency of the Wire Goods Company, of Worcester, Mass., which position, it is understood, he will accept. We note also, in the New Haven papers, that pleasant tributes are paid to Mr. Parmelee, and the best wishes expressed for his success in this new departure. It is intimated that under the new management the Wire Goods Company will increase their line and enter more largely into the market as manipulators of Wire. They will make the full line of Hardware and Mill Bright Wire Goods, Double-Pointed Staples and Tacks, Wire Nails, Belt Hooks, Ring Travelers, Picture Cord Wire, Clothes Line Wire, and a large variety of Wires cut and bent to peculiar shapes for organ-makers, &c. They also manufacture the "Ware Reason-ant," an attachment that is described as adjustable to any telephone transmitter, and is for the purpose of making the voice so much more distinct that conversation carried on in a low tone, after being transmitted through the telephone, may be heard with ease. But the advertisement of the company will be found on page 40, and to it we refer our readers.

NEW AGENCIES.

W. Dodman, 107 Chambers street, New York, has recently been appointed direct representative of the following manufacturers: Myers & Ervien, Philadelphia; Smith Harper, Philadelphia, and Henry Foerster, Newark, N. J. On the goods of all these manufacturers Mr. Dodman is authorized to quote the extreme factory prices, and orders intrusted to him will doubtless receive prompt attention. Myers & Ervien are

known to the trade as manufacturers of Hay, Manure, Spading, Sluice, Tanners', Coke, Charcoal, Coal, Oyster, Turnip and Spall Forks. The variety of these different Forks they manufacture is noticeable, their catalogue covering some goods which are not comprised in the lists of other makers. The catalogue of Smith Harper covers Hoes, Garden Rakes, &c., of which many styles are made. Henry Foerster manufactures a line of Hardware specialties, House-furnishing Goods, Mechanics' Tools, &c., including Pliers, Curling Tongs and Fluting Scissors, Sardine Knives, Revolving Conductors' and other Punches, Claw Tools, Tap Borers, Washer Cutters, Calipers, Saddlers' and other Hammers, &c.

New York Iron Market.

The business of the past week has been more seriously demoralized than has been the case for some time. While not many open transactions are reported, it is understood that in many lines there have been private negotiations resulting in the placing of a considerable quantity of goods at very low rates. This has been done by some manufacturers for the purpose of relieving themselves of the accumulation of stock, and in this way enable them to maintain open quotations for such small transactions as may come along in the way of current business. The only line in which there is any appearance of hardening is in Steel Rails, but, while some companies are asking much higher prices now for Rails, it is intimated that other companies are still willing to accept orders only 50¢ @ \$1 above the lowest quotations that have been made. Anxious eyes are turned toward the Pig-Iron trade in the hope that an improvement in prices may soon be perceived, as it is generally believed that an advance in crude metal would start a buying movement in related lines. It is asserted that almost everything in Finished Iron or Steel is now being sold below cost, and that manufacturers still persist in underbidding one another for the little business that can be secured, with the certainty of heavy losses confronting them, and a possibility of ultimate widespread collapse. Some of the contracts placed during the past week for Finished Iron to be delivered during the coming nine months have been made at figures that even now cannot balance cost, and the contracting parties take the serious risk of an advance in the price of raw material in the meantime that will very greatly widen the disparity. It is certainly time for a word of caution to be uttered. Manufacturers with surplus capital are very foolish to throw it away in such a fruitless contest. Those who have no surplus to draw upon are censurable for selling goods for less than cost, because that means a loss to their creditors. And both classes are doing injustice to their employees, because their senseless competition compels them to reduce wages in many cases below what ought to be considered the minimum for an able-bodied American workman.

American Pig.—The demand shows no improvement, transactions being limited in number and quantities small. The reduced production of Pig Iron in this vicinity, notwithstanding the diminished consumption, keeps the market in about the same condition as that reported for several weeks past. In fact, the standard brands of No. 1 X Foundry are so scarce that some consumers manifest a little anxiety about deliveries. They have been buying so closely that if the Iron they have ordered does not come to hand exactly in time, they may be obliged to suspend operations for a time. This has been the case with at least one large Eastern establishment. Notwithstanding this fact, there is little disposition to buy ahead, but charcoal lots are the rule. No. 2 X Foundry still continues in ample supply, and we hear of concessions being made to induce buyers to take hold of this grade. There is more inquiry for Gray Forge Pig Iron, some large blocks being asked for. In this direction concessions are sought, but manufacturers seem inclined to maintain their prices, and makers of standard brands permit 25¢ to stand between them and those who would like to place large orders. The outlook seems no better and no worse in this line than it has been for some time. The chances for either lower or higher prices are about equal, with a tendency, perhaps, in favor of a continuance of present rates, which for standard brands of Lehigh and North River Pig are as follows, tidewater delivery: No. 1 Foundry, \$19.50 @ \$20.50, with a few special brands commanding \$21; No. 2 X Foundry, \$18 @ \$19; Gray Forge, \$17 @ \$18. Outside brands can be had about \$1 cheaper.

Scotch Pig.—The arrivals at this port during the week were only about 600 tons. The demand shows no improvement, notwithstanding the firmness cabled from abroad. Consumers seem indifferent except in the case of two or three of the most favored brands, which are now in light supply here, and can hardly be imported at the prices latterly current. Quotations continue as follows for small lots: Coltness, \$22 @ \$22.50; Gartabrie, \$21 to arrive, \$22 from yard; Shotts, \$21.50 @ \$21.75 to arrive, \$22 from yard; Langloan, \$21.50 to arrive, \$22 from yard; Carnbroe, \$20.50 to arrive, \$21.25 from yard; Glangarnock, \$20.50 to arrive, none here; Summerlee, \$21 to arrive; Dalmeilington, \$20 to arrive; Eglinton, \$19.25 @ \$19.50 to arrive; Clyde, \$20 to arrive.

Bessemer Pig and Spiegeleisen.—In the absence of transactions or inquiry, Foreign Bessemer is nominally quoted at \$18.50 @ \$19 for shipment. There are some inquiries on the market for Spiegeleisen, but we hear of no sales; 20% is quoted at \$26.75, and 30% at \$31.

Bar Iron.—Very little business in mill lots has taken place during the week, but it is reported that some parties have been forcing Bars on the market at almost whatever price could be realized, though, of course, there are doubts as to the quality of the goods. Store trade still is very quiet. Prices are somewhat difficult to quote under the circumstances, as quotations cannot be realized if an attempt is made to force the market, but those in quest of good brands of Bar Iron seem willing to pay the regular rates for what they require. Quotations are about as follows: Best Refined, at mill, 1.7¢ @ 2¢; from store, 2¢ @ 2.2¢; Common Iron, at mill, 1.5¢ @ 1.7¢; from store, 1.9¢ @ 2¢.

Structural and Shaped Iron.—We hear of no business of any consequence during the week. We quote for small lots as follows: Angles, from store, 2.4¢ @ 2.6¢; Tees, from store, 2.9¢ @ 3¢; Beams and Channels, on dock, 3.5¢.

Plates.—This branch of business is suffering from the competition of manufacturers as well as other lines. The price of Iron Plates is demoralized by liberal offerings. In Steel Plates this tendency is not so marked, as manufacturers of these seem to be in better position. For small lots of Iron Plates quotations are about as follows: Common or Tank, 2.4¢ @ 2.3¢; Refined, 2.4¢; Shell, 2.4¢; Flange, 3.4¢; Extra Flange, 4¢ @ 4.4¢. For Steel Plates the quotations are as follows: Tank, 3.4¢ @ 4¢; Boiler, 4.4¢ @ 5.4¢.

Sheet Iron.—The movement is lighter than that reported last week, but prices are maintained. There is a fair local trade in progress and the prospects are good for improvement as cold weather approaches. Store prices will be found in our list of New York Wholesale Prices.

Merchant Steel.—As indicated last week, there is much complaint of poor business and low prices. Special sales have been made on terms a shade below our quotations, which are as follows for usual lots: American Tool Steel, 9.5¢, with a concession to large buyers; Tool Steel of special grades and finer quality, 12¢ @ 20¢; Crucible Machinery, 5¢ @ 6¢; Spring, 3¢ @ 3.4¢; Open-hearth Machinery, 3¢ @ 3.4¢; Bessemer Machinery, 3¢; English Tool, 1.4¢ @ 1.5¢.

Steel Rails.—A very light business is reported for the week. Sales in this locality hardly amount to more than 5000 tons. Most of the railroad companies which were in the market for large blocks of Rails have succeeded in placing their orders, but it is understood that there are still a few companies that will probably be in the market some time within the next 30 days. Outside of these the demand is expected to be confined to ordinary lots for some time to come. The mills are reported to be in much better condition now, so far as orders are concerned, than was the case a month or so ago, and therefore they are not competing with one another quite so vigorously for business; hence, a firmer feeling prevails and some manufacturers are quoting much higher prices than last week. In one case it is reported that a sale of Rails of a standard size was made at \$20 at mill. Other companies, however, have not advanced their rates quite so high, but are asking only 50¢ @ \$1 more than the very low prices made some time ago, which would put their present price at about \$27.50 @ \$28.

Steel-Wire Rods.—The demand is still very limited and quotations are lower. The prices now asked are from \$45 up, according to time of delivery.

Old Rails.—We can hear of very few transactions. About 100 tons of Old T's were sold at \$16 at a Sound port, and a lot of about 100 tons of Old Street Rails brought only \$19 in this city. Quotations for Old T's in this vicinity are from \$17 to \$18, according to the position of buyer and seller and the quantity and quality of the Rails.

Scrap Iron.—The demand has been very light during the week, only small sales having been reported. Holders are asking \$19 @ \$20 for No. 1 Wrought from yard, though there are more dealers quoting the higher figure than the lower one. Of Cast Borings 100 tons were sold at \$3.50.

Business at the Metal Exchange was exceedingly limited during the week, the only sale reported being one of 100 tons of Iron Certificates (No. 2 Foundry), October delivery, at \$17.50, which was made on Saturday, the 27th ult.

Messrs. Long & Co., proprietors of the Vulcan Forge and Iron Works, Pittsburgh, advise us, under date of September 30, that they have appointed Samuel A. Haines, 88 Chambers street, as their agent in New York City and all points West and South. He will be prepared to make their best quotations on their manufactures at all times, and they commend him to their friends throughout the country.

The shipment of buffalo bones from the plains of the West to Eastern phosphate factories is said to have largely increased recently, because of the reduction in freight

rates. Thousands of buffalo skeletons are gathered up by the bone men of the prairies, especially in the valley of the Arkansas, and sent East to the phosphate manufacturers. A single Philadelphia manufacturer has received during the summer more than 200 carloads of these bones. Delivered at the factories in that city the skeletons are worth \$25 a ton, and the business of gathering and shipping them East is quite a profitable one. The freight from the West is from \$8 to \$10 a ton. Very frequently an entire skeleton is shipped East, and then the different parts are put to curious uses. The horns, which are worth \$30 a ton, are used by umbrella-makers for tips, or by fan manufacturers to decorate their fans. A portion of the head is in demand by chemists, who utilize it for making glue, and the shoulder-blades and neck-bones are taken by button-makers, from which they fashion some of their most handsome and artistic buttons.

Submarine Cables.

The aggregate length of submarine cables in existence, says the *Ironmonger*, is no less than 60,000 geographical miles, or about 111,000 km., or nearly three times as much as the circumference of the earth. Each of these cables consists, on an average, of 40 wires, core and jacket together; therefore it may be said that the length of iron and copper wire by which telegraphic communications are carried on at the bottom of the sea is no less than 25,000,000 miles, or 10 times the distance of the earth from the moon. At the present day there are 17 submarine telegraph companies; and there are also four Governments working cables of their own, viz., the British, the French, the Russian and the Italian Governments. England has laid down in the Indian Ocean 12,018 miles of cable for the protection of her possessions in Asia. France owns about 12,018 miles of cable in the Mediterranean, Russia has some cables in the Black Sea, while those belonging to the Italian Government are few and far between. Of the 17 submarine telegraph companies there are eight established in London, four in New York and one in Copenhagen. The following are the most important of them: The Submarine Telegraph Company own nine cables that connect England with the Continent; among these, those of Dover and Calais, Folkestone and Boulogne, Beachy Head and Dieppe, and Havre. The Eastern Telegraph Company have a great many cables in the Mediterranean; they have also established direct communications between England and Bombay, via Lisbon, Malta, Alexandria and Aden. The aggregate length of this company's lines are 8041 miles.

The Eastern Extension Company carry their lines from Madras to Batavia, via Singapore, Saigon and Hong Kong, and connect Japan with Australia and New Zealand over a length of 6491 miles. The Anglo-American Telegraph Company own the original Transatlantic cables, viz., four between Valencia, in Ireland, and Cape Heart's Content, in Newfoundland. Their lengths are as follows: 1, the cable laid in 1860, 1866 miles; 2, the cable laid in 1866, 1852 miles; 3, the cable laid in 1873, 1900 miles; 4, the one laid in 1874, 1900 miles. They also own the line from Brest to San Pierre, 2584 miles; aggregate length, 11,282 miles. The Direct United States Cable Company have a Transatlantic cable which goes from Ireland to Nova Scotia and Rye Beach, United States, over a length of 3050 miles. The Great Northern Telegraph Company connect Denmark with Great Britain, France, Russia, Sweden and Norway, and they are, moreover, in possession of a cable proceeding from Vladivostok, in Siberia, to Amoy and Hong Kong, via Nankasaki and Shanghai. Lastly, the Brazilian Submarine Telegraph Company have laid a cable from Lisbon to Brazil, via Madeira and the Cape Verde Islands.

An Italian Iron Works.—A consular report from Florence, published in an English contemporary, contains a short account of the iron works of San Giovanni, in Val d'Arno, which were established in 1872. The company promoting the enterprise were unsuccessful, owing, it is said, to the inferior quality of the products, and in 1880 the works were taken over by the Società delle Ferriere Italiane, by which they are profitably conducted. The official domicile of the company is in Rome and the board of management at Florence. The nominal capital is 4,000,000 lire (a lire is about 20 cents), of which 2,000,000 lire are paid up. In addition to the works of San Giovanni and the neighboring mine of lignite, the company hold the iron works of Maniano, and on lease those of Tarquinia Corneto (district of Civita Vecchia). The total gross receipts of the company in 1882 amounted to 328,646 lire, the expenses to 213,039 lire, showing a net profit of 115,607 lire. Great improvements have been introduced within the last two years at the works of San Giovanni. New buildings and machinery have been added, and the monthly output has been raised from about 800 tons to 1400 tons. The gross receipts for the works rose from 87,000 lire in 1881 to 147,000 lire in 1882. The total number of hands employed at the works of San Giovanni is about 600. The workmen are all Tuscan, many coming from the neighborhood of Pistoja. The foremen at the furnaces are paid 7 lire per diem; the hands receive, on the descending scale, 5 lire, 3 lire, 2 lire, and boys 1 lire 500 per diem. The works contain six heating furnaces, three puddling furnaces on the Siemens gas system, four rolling mills, &c.

A Meeting to Discuss the Relations of Labor and Capital.—A report comes from England that arrangements are being made for holding a conference of artisans, capitalists and persons interested in the study of social problems, in London, next January, for the purpose of discussing questions relating to the distribution of wealth between the capitalists and laboring classes. The plan originated with an Edinburgh gentleman, who has given £1000 for carrying it out. The money has been put in the hands of a number of Englishmen of influence and high standing, who will act as trustees.

With the assistance of the Statistical Society, a strong committee has been formed for furthering the scheme, and efforts are being made to collect information, in a statistical form, concerning the actual condition in regard to constancy of employment, command of the comforts of life, health, &c., of those engaged in different industrial occupations. When the conference meets, opportunity will be given for the full discussion of the question as to how far existing evils in our social system are remediable by State interference or otherwise. The upholders of peasant proprietorship, as well as those who advocate the nationalization of land, will have an opportunity of stating their views and submitting them to the criticism of practical men.

Progress at Anniston, Alabama.

The Anniston *Hot Blast* speaks as follows concerning the remarkable growth of that enterprising city:

In 1873 the city of Anniston was founded by Messrs. Tyler & Noble. A model city was laid out, and then followed improvements of various kinds, forming a nucleus for a great city in the most salubrious and beautiful spot in Alabama. This company built extensive furnaces, a cotton factory, water works, schools and churches, and macadamized some of the streets. The basis of a city having been fixed in June, 1883, they threw open the gates of the city, and invited the world to come in and enjoy the fruits of their industry and enterprise. Few people away from here have any conception of the amount of work done on Anniston within the past year. A hotel, on which \$100,000 has already been spent, has been begun and practically finished. It will be the richest hotel in finish and equipment in the South. A national bank has been established, with \$100,000 paid-up capital, over \$150,000 deposits, and has already earned and paid a semi-annual 4 per cent. dividend, and passed to surplus 5 per cent. more. A railroad more than 40 miles long has been built and equipped by the company and its friends at a cost of \$750,000. This has been paid in cash, and only \$10,000 of bonds sold. The road penetrates the richest valleys of Alabama, and will be pushed northward to the Tennessee River. It has secured for Anniston the same through freight rates given to Atlanta and Montgomery. A car factory has been built, and is now turning out fine cars. A rolling mill has been built, to employ 120 hands, and the machinery is now in position. Large car-wheel works have been built, and 150 hands are at work. One of the largest foundries owned by a private firm in the country has been established. The capacity of the iron furnaces has been increased 25 tons per day. Two planing mills, one lathe mill and three brick-yards have been started, one ice factory and various smaller industries. Over 300 new houses have been built in the year, including about 20 brick stores. This has required double the force of mechanics employed last year. More than 30 business firms are engaged in business in the city where there was only one a year ago. The population has been increased 50 per cent. within the past 12 months, and is made up almost entirely of busy workmen. An opera house has been built, a \$30,000 Episcopal church started and got well under way, two fire companies organized, a turnpike road cut across the mountain to the rich Choctawhatchee Valley, many new streets opened and graded, and various other improvements made for the comfort of Anniston and the extension of its trade.

Activity in Naval Affairs.—Advices from Washington state that the Navy Department is pushing the construction of the steel guns for the new cruisers. The material of which these guns are made is furnished by the Midvale Steel Works, of Philadelphia, for the 5 and 6 inch calibers, while that for the larger calibers is imported from England, there being no hammer of sufficient power in this country to forge ingots of steel of sufficient size for such heavy guns. A gun formed of a steel tube and an inclosing jacket, which will afterward be covered with strong steel wire wound upon it under great tension, is now in course of manufacture, and its completion and trial are awaited with much curiosity, for, should it prove successful upon thorough trial, the question of producing all the material necessary for large guns in this country will be much simplified. The carriages, projectiles and other ordnance material for the new cruisers are also being manufactured at the Washington Navy Yard, and will be of the most modern description.

The Charcoal Iron-Workers.—The Fifth Annual Convention of the National Association of Charcoal Iron-Workers was opened at the Southern Hotel, St. Louis, on Tuesday, with W. H. Lee, of St. Louis, presiding, and John Birkinbine, of Philadelphia, secretary. There were from 75 to 100 members present.

A fire occurred at Natrona, 20 miles from Pittsburgh, on the West Pennsylvania Railroad, on Tuesday, by which the Pennsylvania Salt Manufacturing Company's acid manufactory at that place was damaged to the extent of \$100,000. The company, which is the largest of the kind in the United States, has property there valued at \$500,000, and has 27 acres under roof. The largest of the buildings was destroyed. In it the process of making oil of vitriol from Spanish pyrites was employed. The company is composed of Philadelphia gentlemen, and the main office is located there. The building burned is fully insured.

M. Héte, the well-known French chemist, has recently been occupied with the question of purifying zinc from the arsenic and antimony which it usually contains. The process which he finds most effectual is to melt the zinc with chloride of magnesium. If the arsenic then takes the form of chloride of arsenic, and antimony, when present, is also disengaged with it.

Experiments with Metal Sleepers.

There is again some talk in railway circles on the Continent of metal sleepers, of which we have not heard much lately, says the *London Railway News*. It remains to be seen, however, whether the companies will now look upon them with greater favor than heretofore. As our readers will remember, the sleeper of steel or iron was the idea of a Frenchman, M. Vautherin, but the inventor found, like so many other inventors, that there was no honor for the prophet in his own country. France soon forgot all about the metal sleepers. In Germany, however, experiments have long been going on intermittently to test their value. As long ago as 1867 the Berg-March Company laid down 664 iron sleepers on their line between Schlusbach and Mulheim. They were 2 meters 20 cm. long, and weighed 28½ kg. It was found difficult, however, to keep the rails close enough to their supports, and the Vautherin sleepers were for the time abandoned. In 1874, however, another experiment was made on the same line, this time between Schwerte and Wicked. No less than 25,000 Vautherin sleepers were put down after being slightly thickened in the center to improve the joint with the rail. Most of the sleepers are still in position, although many of the old faults soon showed themselves. In 1877 a stronger metal sleeper was devised, which, when laid in such a way as to impregnate the ballast, which had hitherto gradually moved from beneath, was found to answer. Soft steel, which can be made in Germany comparatively cheap, has been found to be the best metal for the purpose. The cost of the metal sleepers is said to be only slightly in excess of the wooden ones, a disadvantage which, it is claimed, is amply compensated by their great durability. A contract has, we are informed, very lately been entered into for the supply of 220,000 iron sleepers to the Baden railway system.

The Pay of Trainmen.

So common is it to remark that railroad men, especially train employees, are poorly paid that the *Indianapolis Journal* has taken the trouble to ascertain the average salary paid per month to the men in the different branches of train service, selecting July, which was the dulllest month in the year with the Indianapolis railroads—which are a fair criterion of other roads centering there—show that on one road the highest amount paid to any engineer was \$117.25; the lowest, \$97.35; on the second road, \$108 the highest, \$97 the lowest; on the third road, \$108 the highest, \$96.40 the lowest. All were paid on the trip, or mileage, basis, as is the case with the majority of the roads of this country. The pay of the firemen ranged as follows: On road No. 1, highest \$56.70, lowest \$51.80; road No. 2, highest \$56.35, lowest \$51.20; road No. 3, highest \$52.65, lowest \$42.70. The ground is taken that firemen are practically apprentices. The brakemen were paid on road No. 1, the highest \$56.80, lowest \$50.40; road No. 2, highest \$52.50, lowest \$41.25. The pay of the conductors averaged as follows: Road No. 1, highest paid conductor \$93.80, lowest \$87.75; road No. 2, highest \$97.50, lowest \$86.10; road No. 3, highest \$96.20, lowest \$85.80. In every case trainmen, when business is heavy, can considerably increase their pay by making extra trips. Freight-train men receive the largest pay per trip or mile, but are required to do more hours of service.

Philadelphia manufacturers are looking into the question of supplying themselves with water instead of depending upon the city for their supply. The Enterprise Manufacturing Company, the well-known hardware manufacturers, have recently completed an artesian well at their establishment, at a cost of \$2000. This well is 250 feet deep and furnishes 75 gallons of pure and intensely cold water per minute. They will cut off connection with the city mains and rely on this well for their supply. The interest on the investment will be but \$120 per year, at 6 per cent. The cost of operating the well will be very slight, and they will be able to save nearly \$1000 per annum in ice bills and water taxes. Other manufacturers are discussing the question, and it is probable that this policy will soon be adopted by several other establishments.

Mr. Victor Drummond, British Consul at Vienna, in a report to the Foreign Office, makes several statements which show the industrial progress of Austria. The steel trade is chiefly carried on in Styria, Carinthia, Upper Austria, Bohemia, Northern Moravia and in Silesia. Bessemer-steel making has become a large industry, especially in Austria proper, there being only two works of that class in Hungary. Wire is produced most largely in Styria and Lower Austria, while Carinthia has a reputation for iron plates. Hardware is manufactured on a large scale in Austria, Styria, Bohemia, Moravia, Silesia and Carinthia. The export of scythes, sickles and straw-cutters amounts to 8,000,000 per annum, but in what directions the report does not show. Knives, scissors, firearms and ironmongery in general are largely made and exported to Egypt, Turkey, the Danubian countries, Asia Minor and Russia.

An item which of late has appeared in several of our exchanges, and relates to the height of ocean waves, says: "In scientific works published 50 years ago it was distinctly asserted that no wave rises more than 10 feet above the level of the sea, this making with corresponding descent 20 feet between the trough and the crest. Johnson's Encyclopedia gives the extreme as 30 except for tidal waves, which rose (in one case) as high as 60 feet. We think (both these are exaggerations. We once saw a very rough sea which was described in print as 'very majestic, the waves rolling mountains high,' which we examined carefully with a view of determining the height of the wave. We satisfied ourselves in that case that the wave did not rise more than 7 feet above the level, making 14 feet from trough to crest. This was the highest we ever saw. We reckon this as the highest usually seen in very rough passages across the ocean."

English Letter.

(From Our Regular Correspondent.)

LONDON, September 15, 1884.

THE WEEK

has not been marked by any striking changes, but it appears pretty clear that we are not going back—indeed, there are signs of increased activity in many branches of trade. To the iron trade and its nearer allies I allude presently, but I may say here that in many of the hardware and miscellaneous industries there is more work in hand, and manufacturers begin to express themselves in much more hopeful terms as to the near future and the winter's production. The splendid weather of the week has been of considerable service in Scotland and such parts of the North of England as have had a backward harvest, so that the general outcome of the ingathering of the crops may be taken to be as good as could have been anticipated by the most sanguine. This feeling has very much to do, there can be no doubt, with the tentative amendment now in progress, and the manufacturers of Birmingham, Sheffield, Wolverhampton, &c., are doing their best to utilize the feeling to the best possible advantage. Their travelers are "drumming" up the retailers in the most systematic and energetic manner, and are meeting with so considerable a measure of success that the works are daily becoming busier and a much better complexion is being assumed in hardware circles generally. In saying all this I think it advisable to repeat my caution of last week. We are not experiencing a boom or anything approaching thereto. All that is happening or is likely to happen is the perfectly legitimate outcome of the capital harvest, coupled with the large amount of British capital kept at home this summer by reason of the cholera scare on the Continent of Europe. At present the heavier industries are scarcely affected, but, as I remarked in my last, their turn will come, and it might possibly come to pass that we might then advance by leaps and bounds. For the present we are content to "make haste slowly," and have so many arrears to fetch up that we cannot be easily frightened into anything resembling a sensational boom.

JOBBER'S AND PRICES.

I have read with a good deal of interest the remarks of your own on this subject, as well as the somewhat voluminous correspondence which has been published in *The Iron Age* under the same head. The matter is one which merits attention all over the world, and has for some time past been under discussion here, as well as what I may term "under action." Your jobbers can scarcely be said to have any exact counterpart here, but our middlemen—whether they call themselves merchants, factors or wholesale dealers—are pretty much on the same level as your jobbers in respect of their line of action and their effects upon the course of trade. Here, as with you, the middleman has been and is still a distinct hindrance to the proper progress of business, and is an obstacle to the complete success of manufacturers which is being gradually improved out of existence. In the very nature of things the middleman is antagonistic to the perfect well-being of both manufacturers and retailers, seeing that he intervenes between them and prevents that direct intercourse which alone enables the producer to do his best for the retailer and the latter for the public. A new article or a really good thing of any kind does not appeal to the jobber or middleman at all. He is neither maker nor distributor, and the only way you can quicken his zeal or appeal to his instincts is to give him something upon which there is a large profit. Give him one article of the worst kind, on which he gets 25%, and another of the best possible construction, on which he can get 10%, and he will move heaven, earth, and the other place also, to secure the sales of the rubbish, while he neglects the reliable goods. In so doing he may "stick" the persons to whom he sells, and he certainly does harm to the respectable firms who sell to him, but that is a matter not worthy of his consideration, and his policy must ever be the same. One cannot altogether blame the jobber for this; it is a necessity of his position. But what can be said of the makers who allow an intermediary to run their business; who are content to stand aside and let the outcome of all their capital, skill and energy be played with by a middleman to whom nothing appeals so strongly as an extra 5%. To me such conduct seems simple lunacy and one totally unworthy of a progressive and enlightened people like the American nation. In this country old habits and channels of business have tied us up more tightly, but even we are discarding the merchants and are resolutely going direct to the retailers as the only way of meeting modern competition and its resulting bare selling prices. The best of our manufacturers are pushing all over the world on their own account, and are fully convinced that they must do so if they mean to retain their connections. When a merchant receives an order either from home or abroad he seeks to fill it at the lowest possible price, irrespective of any mention of particular goods. To him the quality is purely a secondary consideration. A buyer in the colonies may intend for "Smith's axes" or "Brown's tinware," but if he can possibly do so the middleman will buy lower-priced goods and ship them as being "equal to" those specially asked for. Smith and Brown are therefore defrauded, and their efforts to extend their businesses are frustrated. What with the telegraph, railways and speedy ocean communication, however, this old style of relying upon the middleman is dying out, and, as I have already said, our best makers have learned to rely upon themselves. The change is wholesome and good for everybody but the middleman, who is keenly chagrined by the changed conditions of these modern times, but cannot save himself, and will sooner or later wholly disappear.

THE IRON MARKET

presents no new features since last week, though it is to be feared that the somewhat improved tone which then character-

ized the market must by this time have vanished in the presence of the very unsatisfactory statistics published by the Board of Trade. It may be that the measure of trade revival so naturally looked for in the last quarter of the year will be of a much more limited character than is commonly expected, but it must be said that, though the revival is rather tardy in manifesting itself, there is no particular reason why it should not reach considerable dimensions when it does come. There can be little doubt that the holiday season is still prejudicially affecting business generally, and until the relaxation thus induced—necessary as it may be—has terminated, so long will the wheels of trade be slow and spasmodic in their motion. If the number of furnaces in operation, compared with those actually built, were to be taken as a criterion of the prosperity of the iron trade, it is probable that the present would be regarded as one of the most discouraging periods in the modern history of this industry. But it must be remembered that, although there are now 458 furnaces in blast, as compared with 434 in a state of temporary extinction, not a few of the latter owe their existence to the "boom" which set in three years ago. Now that the "boom" has disappeared, these furnaces are found to be superfluous, though they really indicate no worse state of trade than prevailed before their erection. Within the past few days a rumor has prevailed that the Scotch ironmasters are contemplating a restriction of production unless the landlords agree to reduce their royalties and the railway companies offer more favorable rates. The subject of royalties is certainly a very important one, for, as Mr. I. Lowthian Bell recently showed, this imposition tells very severely against the English producer, who is much less favorably circumstanced in this respect than his Continental rival. As for inducing the railway companies to lower their rates, it is to be feared that the task will prove to be one of great difficulty, for corporations, as we all know, have no consciences. Nevertheless, the Scotch ironmasters must perceive that without action and agitation they will gain nothing, and the sooner they begin the better.

The Scotch iron market has again assumed a hopeful aspect, warrants closing at 41/6 1/2. Special brands are reported to be scarce, and in or two instances an extra 6d. at 1/6 has been secured by sellers. Shipments have shown up better within the past few days, but the falling off for the year is upward of 67,000 tons, as compared with 1883, and there is no prospect that the deficiency will be made up in the coming quarter. The manufactured iron trade is steady, but orders on account of new shipping are exceedingly scarce. At Middlesbrough the market is still devoid of animation, and buyers continue to hold aloof. For the next two months merchants sell No. 3 at 36/3, while No. 4 forge is said to be offering at 33/9 for bulls' orders, which, however, do not come. Dealing in warrants is practically dead. For manufactured iron quotations are: Bars, £5. 5/6; angles, £4. 15/; ship plates, £5; boiler plates, £6, less 2 1/2. The wages question in this district is again assuming prominence, and will have to be dealt with. The value of the sliding-scale arrangement has been so well demonstrated to the workmen that it is to be hoped the question will be approached on both sides in a conciliatory spirit. The hematite market is completely stagnant, and Bessemer, mixed sorts, is nominally quoted at 43/6 for No. 1, 43/ for No. 2, and 42/6 for No. 3. A more cheerful spirit has this week animated the Wolverhampton market, and in most departments buyers were noticed to come forward more freely. The minimum for singles was £7; doubles, £7. 10/; and ladders, £8. 5/ @ £8. 10/. Bar iron was stronger, medium being quoted at £6. 10/; and common hoops, £6. 5/. Sheet and wire-rod makers are briskly employed, and have no difficulty in obtaining 26. 10/ up to No. 4 gauge, f.o.b. Liverpool. Agents for common pigs, outside make, booked a fair share of orders at an advance of 2/6. The failure of the attempt to effect a settlement between the colliery owners and their workmen has strengthened the market. In other districts there is nothing new to report. The general feeling, however, may be said to be one of hopefulness, and a belief that before many weeks have elapsed trade and commerce must take an upward turn.

A fairly good number of orders have been placed within the past week, both for Bessemer and crucible steel. The demand, however, leaves much to be desired, and there is still a considerable lack of employment in all the producing centers. It is now authoritatively stated that Bolckow, Vaughan & Co. will two months hence be in a position to roll sheets for shipbuilding and other purposes, but at present the outlook for more tonnage does not seem very promising. At the North-Eastern Steel Works steel for miscellaneous uses has been produced for some time past. A few leading firms in the marine-engineering trade are known to be very busy with home and foreign Government orders, but most of the shops, as a rule, far from brisk. There is little or no demand for steel rails, the few firms engaged in this class of manufactures running short time. At Aston, where the stock is reported to be very large, some few orders have been booked which will afford a few weeks' employment to about 1000 men, but in other quarters operations are being conducted on the most limited scale. The nominal quotations for steel rails, usual section, is £4. 15/.

SCOTCH PIG IRON

is fairly steady; indeed, there is a decided disposition in some quarters to look upon the future with some little assurance of changes in an upward direction. This tone mainly prevails among the producers of special brands, who say they have a well-maintained call, and point to the continuous drain on Connal's stocks in further support of their assertions. Another furnace has been blown in at Carnbroe, making the number now in blast in Scotland 95, as against 115 this date last year. In Connal's stores the stock decreased by 445 tons last week, leaving the quantity there 584,767 tons, as compared with 586,035 tons a year back. The shipments to date show a decrease of 67,981 tons, while importations of Middlesbrough pig

into Scotland have decreased by 6697 tons.

Deliverable alongside.	No. 1.	No. 2.
Gairsherrrie, at Glasgow.....	53/ 34/	50/
Coltness, ".....	60/	51/
Langloan, ".....	57/	52/
Summerlee, ".....	52/6	47/8
Calder, ".....	52/3	47/3
Carnbroe, ".....	50/	46/6
Clyde, ".....	48/	46/
Monkland, ".....	45/6	46/6
Quarter, ".....	41/6	40/3
Govan, at Broomielaw.....	42/9	40/6
Shotts, at Leith.....	52/	51/
Carron, at Grangemouth.....	48/	47/6
" " specially selected.....	52/6	47/6
Kinnell, at Boness.....	43/6	48/
Glengarnock, at Ardrossan.....	49/6	48/
Eglinton, ".....	44/	40/9
Dalmellington, ".....	47/	48/

In Middlesbrough and hematite pigs the week has brought no changes of importance.

THE BOARD OF TRADE RETURNS

for the month of August are very disappointing, both sides of the accounts showing large decreases. The imports fell off by £6,614,000, and the exports by £1,582,905. The aggregate value of the month's imports was £29,610,739, as against £36,224,986 in August, 1883. The total value of last month's exports was £19,802,057, as compared with £21,384,962 in the same month of last year. The total quantity of iron and steel exported last month was 273,437 tons, valued at £1,825,568, as compared with 365,500 tons, valued at £2,397,312, in August, 1883, so that the decline in values is even more marked than the decreased quantity. The principal exports of last month to the United States were as follows:

Articles.	Month of Aug., 1884.	Month of Aug., 1883.	Month of July, 1884.
Alkali, cwt.....	108,618	295,576	146,092
Hardware and cutlery, £.....	27,372	31,606	34,483
Iron—pig, tons.....	21,495	18,597	17,767
Bar, angle, rod, &c., tons.....	631	305	191
Railroad, all, tons.....	1,293	9,623	4,102
Hoops, sheets, plates, &c., tons.....	4,778	3,697	1,737
Plates, tons.....	15,544	21,114	23,899
Cast or wrought, tons.....	359	332	62
Old, tons.....	952	1,151	2,101
Steel, unwrought, tons.....	665	957	1,127
Lead, all sorts, tons.....	72	3	50
Steam engines, £.....	3,989	119	4,455
Other machinery, &c., £.....	30,349	19,608	33,338
Tin, unwrought, cwt.....	201	851	1,029
Special return—Iron rails, tons.....		120	
Steel rails, tons.....	1,232	9,391	4,135

THE METAL MARKET.

Messrs. Henry Rogers' Sons & Co., London, have the following interesting remarks on the recent course of copper and tin: "The advance in the price of Chili bars noted in our last has not been maintained, and we quote sharp cash £54. Our total apparent supplies, taking into account cable advices, have fallen 500 tons during the month, but the American shipments have, no doubt, increased private stocks, and possibly cause the published figures to be misleading. It is announced that the shipping contracts for American ore, which terminated in August, have been renewed, but the quantity to be sent forward is not in excess of anticipations. One feature of the month has been the large India demand for copper and yellow metal, but, large as it has been, it has not caused smelters to buy in the open market. Looking at the reduction, both in value and in available supplies, as compared with a year ago, it may seem strange that no advance in price is lasting, but while furnace material is freely offered at prices below the value of Chili bars without attracting smelters, who are secure of their regular American shipments under contract, no rally is long sustained. Meanwhile consumption continues enormous under the stimulus of moderate prices."

The course of the tin market has been most discouraging to holders. Notwithstanding the large quantities shipped to America, prices fell at the close of August as low as £81. 5/ for both spot and three months, and during the last day or so forward tin has been sold as much as 7/6 under the price paid for immediate delivery. In favor of prices may be urged the reduction since the beginning of the year in total supplies, the small landed stock in London and the moderate value. On the other hand, we have the doubts as to the actual quantity stored in America. Again, according to telegrams received from undoubted sources in Australia, the shipments during the past two months are 300 tons more than generally credited, and on the 31st of August the stock in the Straits reached the figure of 850 tons, 200 tons of which were held speculatively, and 550 tons were waiting freight opportunities. The breaking up of the drought in Australia, we are advised, will cause the shipments during the later months of the year to exceed our earlier estimates, and full supplies are to be expected from the Straits independently of any surplus directed to this market through the possible failure of the China demand. It is important to notice that if account be taken of the stocks in the Straits, of the full Australian shipments and other similar considerations, the total stocks of the world have in reality increased during the last month.

METALLURGICAL NOTES.

Open-Hearth Basic Steel.

Nearly 12 months since, said the London *Iron Trade Exchange* in a recent issue, we referred to the experiments made at the Farnley Company's works, near Leeds, by Mr. Thomas Gillott, with the view of producing high-class steel by the basic process in a Siemens open-hearth furnace. Mr. Gillott has placed on record the results of his experiments in a paper read by him during the past session of the Institute of Civil Engineers. Mr. Gillott commenced his experiments at the Farnley works in May, 1882, and after many months of continuous effort he succeeded in producing steel of the very highest quality from Farnley cold-blast iron and iron and steel scrap. The great difficulty which Mr. Gillott had to contend against was to obtain a suitable basic lining for the furnace, as no basic bricks, excepting such as were too costly, were suitable for constructing the furnace throughout. Eventually bricks were made from magnesite, containing 98 per cent. of carbonate of magnesia, and others from bauxite, approximating silica 16, alumina 82, lime 1, peroxide of iron 2. The furnace, which was lined with these bricks, had previously been

worked by the ordinary acid process, with charges of 50 to 55 cwt., and alterations were made for drawing off the slag during the process, so as to reduce the amount of purification in the later stages. In altering the furnace, brackets were bolted to the side plates, to prevent settlement of the upper brickwork in case of any shrinking of the lime basin, or fluxing in work. The furnace when at full melting heat is ready to receive the "bottom," which consists of freshly-ground magnesian limestone laid over the bottom and up the sides, with not more than 10 per cent. of ground fire-brick added, so as to flux the lining for forming the furnace bottom. When the furnace is ready, fresh and well-burnt lime is laid upon the bottom of the furnace, and on this the pig iron is placed, and the wrought iron and steel scraps are charged on the top of this pig iron, all being introduced cold. In three or four hours, the pig iron having melted, some slag is drawn off. In three and a half to six hours the whole charge is melted, and more slag is drawn off, as required; if the slag is very fluid more lime is put in, and ore with the lime if the proportion of pig to scrap is high. When the boiling ceases, and after the metal has been stirred, samples are taken from the furnace ladle and cast into an ingot about 3 inches in diameter by 2 or 2 1/2 inches thick, and when sufficiently cool this ingot is hammered into a 3/4-inch plate, then bent double and broken. If the metal is sufficiently pure the samples are so tough as to be nearly broken by being flattened close, and the fracture is free from crystals, and of good color. If the sample is satisfactory the remaining slag is drawn off and 5 per cent. of hematite pig is introduced into the furnace, which when melted causes the metal in the bath to boil for about 15 minutes. Mr. Gillott tried repeatedly to obtain the desired quality of steel without adding pig iron at the end of the purification, but in these instances the results were uncertain and irregular. The quality of metal which the Farnley Company desired to produce was that which possessed the greatest ductility when cold, and capable of sustaining, without failure or injury, the severe tests required by the most difficult flanging and welding when hot. That Mr. Gillott succeeded in producing suitable material for the purposes required, the tests he obtained clearly show. In his paper read before the Institute of Civil Engineers Mr. Gillott purposely omits the question of cost, but he states that the process is more costly than the ordinary Siemens system, the furnace requiring more expensive repairs. Mr. Gillott's opinion is that for the production of exceptionally soft steel of great purity, and the utilization of much wrought-iron scrap and certain kinds of phosphoric pig, the basic open-hearth process offers peculiar advantages, and will doubtless be developed in the future. It should be noted that the only pig iron used in Mr. Gillott's experiments was Farnley cold blast iron, which is low in silicon and sulphur, and the success of the experiments may be largely attributed to the valuable character of the raw material used.

New Method of Producing Wire, Bars, Rods, &c.

Dr. F. C. G. Müller has invented a process for producing wire, rods, bars and similar articles of various section direct from the molten metal by casting them continually in a mold open at both ends, and drawing or moving them out continually after solidifying during their passage through the mold, the metal being under compression during the operation. In carrying out this invention a cylinder 4 feet 6 inches high and 2 feet 6 inches in diameter is used, capable of holding, after lining with refractory material, about 1 ton of molten metal. The cylinder rests by means of a surrounding flange on the supporting brickwork, and is constructed of steel plates 1 inch in thickness. It is closed at the top and bottom by steel plates which are bolted on to the shell of the cylinder. The inside of the cylinder is lined with basic or acid refractory material 8 inches in thickness, the bottom plate being lined separately, so as to allow of its easy removal, together with the refractory lining, for the purpose of making necessary repairs. In the top plate is a manhole, and a small pipe connects the inside of the cylinder with a steam boiler or a gas holder containing fluid carbonic-acid gas or steam under pressure. Near the bottom lining there is another manhole, opposite which is a circular opening through the shell of the outer cylinder and its lining 8 inches in diameter; into this hole fits horizontally an iron cylinder in diameter about 24 inches long and 8 inches in diameter, securely connected with the shell of the vertical cylinder and projecting about 4 inches into its refractory lining. Instead of only one horizontal cylinder two or more may issue radially from the shell of the vertical cylinder. Into the horizontal cylinder fits closely a second cylinder, constructed of wrought or cast iron about 20 inches long and 7 inches in diameter, securely closed at both ends by means of wrought or cast iron plates. Through the center of this inner cylinder and through the end plates passes a steel or bronze tube, slightly conical, being larger toward the outer opening, and of the same section as the manufactured article to be in its finished shape. If round wire is to be made, it is preferred to make the tube of 3/4-inch diameter and with a thickness of 1/4 inch. This tube is well polished inside, or it may be lined with a hard and incombustible non-metallic material, and is securely connected with the closing end plates of the inner cylinder. Before inserting the inner cylinder containing the tube into the larger horizontal cylinder a quantity of refractory material in a moist state is firmly rammed into the inside end of the outer cylinder, or else a ready burnt refractory piece accurately fitting may be introduced. The inner cylinder or cooler containing the tube is then inserted, and finally a plate closes the outside opening of the outer cylinder all but an opening in the center, corresponding with the tube, which plate also keeps the inside cylinder in position. A metal pipe capable of furnishing 1 gallon of cold water per second passes through the cover or front closing plate of the horizontal cylinder into the inside of the inner cylinder, while a similar pipe reaching near to the back closing plate is to carry off the heated water. In carrying

out this invention a wire rod or bar is inserted into the tube of the same section and completely filling it, penetrating through the refractory material at the inner end of the horizontal cylinder, and projecting a few inches into the inside of the vertical cylinder. The inside of the vertical cylinder is then brought to an elevated temperature, approaching in the case of steel a white heat, by filling it through its top manhole with coke and applying an air blast at the manhole near the bottom. The ashes and cinders are afterward removed through the lower manhole, and the latter is then securely closed. Cold water is now continually admitted into the inner cylinder by one tube and drawn off at the same end by another. The molten steel or other metal is then poured into the vertical cylinder through the manhole at the top, and when sufficiently filled the latter is securely closed. The hydrostatic pressure of the molten metal itself contained in the vertical cylinder would be sufficient to cause the metal to enter the tube in the horizontal cylinder continually; in order, however, to insure a steady passage of the metal through the tube without danger of breaking off the continuity of the metal in the same, and also to prevent the gases occluded in the molten metal from issuing and forming a defective product, dry steam or carbonic-acid gas is admitted under considerable pressure into the inside of the vertical cylinder at the top. On giving the wire, rod or other article inserted into the horizontal tube a forward motion by means of a pair of rolls or otherwise, the molten metal enters the tube, and, in passing through it, becomes solidified. In manufacturing, for instance, steel wire by this process, the red-hot metal is compressed from 3/4 inch as it issues from the tube to 1/4 inch, by means of a pair of rolls, the wire being finally wound round a drum.

Effect of Heat on White Cast Iron.

M. Forquignon, in a paper before the French Academy, gave an account of some recent experiments made by him to ascertain the effect produced by heating white cast iron in a vacuum. The iron to be heated was surrounded by platinum, so as not to come in contact with the sides of the heating chamber. The chamber, after being thoroughly dried, was exhausted of air. Hydrogen gas heated to 200° C., and which had previously dried by passing over cooled anhydrous phosphoric acid, was then admitted, and the chamber afterward again exhausted, which operation was repeated a number of times. The iron was not raised to a red heat until the oven had been carefully maintained at 200° C. for 12 hours and at a constant vacuum, the gas disengaged being removed by an air-pump, so that the pressure was never above 1/2 mm. of mercury. The temperature of the chamber was then raised to from 900° to 1000° C. and kept so for several days without the iron being softened or fused. When the iron was taken out and examined it was found to have become malleable, the surface being covered with a dull, grayish coating that left a mark when rubbed on paper or unglazed porcelain. The fracture sometimes was a uniform black, like plumbago, and sometimes was covered with rather large black points of amorphous graphite regularly scattered on the surface. The following two analyses show the composition of the iron before and after heating:

No. I.	Before heating.	After heating 172 hours in vacuo.
Carbon combined.....	2.959	0.595
Carbon graphite.....	.....	2.091
Total.....	2.959 pr. ct.	2.959 pr. ct.
No. II.	Before heating.	After heating 168 hours in vacuo.
Carbon combined.....	2.884	1.129
Carbon graphite.....	.....	1.676
Total.....	2.884 pr. ct.	2.885 pr. ct.

These experiments were made with charcoal pig iron marked "D. P.," furnished by the Dalrif Works, and contained but from 1 to 2 one thousandths of 1 per cent. of manganese. M. Forquignon thinks it probable that this partial decomposition of iron—contrary to the cementation of soft iron—depends on a state of equilibrium that tends to establish between the carbon, the iron and the carburet of iron, the relative proportion of each of these bodies being governed by the temperature to which the metal is subjected. M. Berthelot has discovered and formulated the laws that govern many similar equilibria that obtain in the chemical compositions. The amount of carbon freed when the temperature increases evidently passes through a maximum, since the carburet of iron originally present will be entirely changed by fusion. Another very interesting fact is noticed in this connection—which is the division of a homogeneous solid into two other bodies equally solid and without any appreciable evolution of gases.

An Englishman's Views on English Trade.

In a recent issue of the *Ironmonger* appeared the following extract, which was part of an letter written by an ex-Sheffield merchant and manufacturer from Australia. The writer evidently thinks that England is gradually losing her foremost position in the trade of the world: "I belong to that class who think that England's best days are past. I thought so before I came out here, and now am more and more satisfied that it is so. When I see the American tools that are sent here, also some from Germany, and when I see good workmen—men who know when they get hold of good implements—prefer these tools to the English-made tools, and will give a higher price for them than for the English tools, these things confirm me in my opinion that England is no longer the manufactory of the world. In many kinds of goods foreigners have got hold of the market here, and the English people will now have to produce something superior to these, and as low, or lower, in price, before they can get the trade. There are, of course, many kinds of English goods sold here, but I should think that fully one-third of the trade which ought to come to England goes to America and Germany, and little by little other articles are being pushed into the market, so that if our home manufacturers do not look out they stand a chance to lose more ground in the colonies, rather than to regain that which they have lost."

Wholesale Hardware Prices, October 1, 1884.

HARDWARE.

[illegible][illegible][illegible][illegible][illegible]

Parallel, Fisher & Morris Double Screw.....ds 15.60
Parallel, Parker's.....ds 25
Parallel, Wilson's.....ds 50
Parallel, Howard's.....ds 30
Parallel, Bonney's.....ds 35
Parallel, Merrill's.....ds 15.50
Parallel, Sargent's.....ds 60.00
Parallel, Backus and Union.....ds 40
Parallel, Double Screw Leg.....ds 15.50
Parallel, Prentiss.....ds 25
Parallel, Simpson's Adjustable.....ds 60
Saw Filers, Bonney's.....\$ dos \$15.00, ds 35
Saw Filers, Stearn's.....ds 20.00
Saw Filers, Hopkins.....\$ dos \$17.50, ds 10
Saw Filers, Reading.....ds 40.00
Saw Filers, Wentworth.....ds 10.00
Rowell Hand Vises.....ds 20
Richardson's Vise and Anvil.....ds 25

Washers Cutters.
Smith's Patent.....\$ dos \$12.00, ds 20.00
Penny's.....\$ dos Pol. \$14, Jap'd, \$16, ds 35
Appleton's.....\$ dos \$18.00, ds 60.00
Bonney's.....ds 30


Washers.
Well Wheels.....ds 60 & 10

Brass and Copper, new list, Jan. 18, 1884.....ds 20
Market, Bright and Annealed, Nos. 0 to 18.....ds 07 1/2
Market, Coppered.....ds 08 1/2
Market, Galvanized.....ds 55
Market, Tinned, Tinned list.....ds 57 1/2
Stone, Bright and Annealed Nos. 19 to 35.....ds 70
Stone, Bright and Annealed Nos. 37 to 38.....ds 72
Stone, Galvanized, Nos. 19 to 30.....ds 52 1/2
Stone, Tinned, Tinned list.....ds 57 1/2
Tinned Broom Wire.....ds 60
Cast Steel Wire.....ds 55
Annealed Fence, Nos. 4 & 5.....ds 67
Stubs' Wire.....\$ dos \$10.00 to \$2, ds 55
Fence Staples.....\$ 56 1/2
Fence Staples, Galvanized.....\$ 62 1/2
Stubs' Wire.....\$ dos \$10.00 to \$2, ds 55
Barb Fence.....See Trade Report
Wire on Spools.....ds 55
Stubs' Wire.....\$ dos \$10.00 to \$2, ds 55
Picture Wire.....ds 55
Clothes Line Wire, galvanized.....\$ coil 25¢ @ 40¢ net
Fence Cloth, green, drab and black, \$ 100 sq. ft.....\$ 2.00 @ 2.25 net

Wrenches.—American Adjustable.....ds 45
Saxter's Adjustable "8".....ds 35 1/2
Annealed Grape, Nos. 10 to 14.....ds 35
Coos Genuine.....cash in 10 days, ds 60.63
Coos' Mechanic.....ds 60.10.63
Coos' Pattern, Malleable.....ds 73.15
Coos' Pattern, Wrought.....ds 75
Girard Standard.....ds 65.10
Girard Agriculture.....ds 75
Bemis & Call's Patent Combination.....ds 30
Bemis & Call's Merrick's Pattern.....ds 35
Bemis & Call's Briggs' Pattern.....ds 25
Bemis & Call's Cylinder or Gas Pipe.....ds 40
Alken's Pocket (Bright).....\$ 00, ds 50.00
Best Favorit Pocket (Bright).....\$ dos \$4.00, ds 50
Webster's Patent Combination.....ds 25
Agricultural Wrenches, Eberhard.....ds 35 1/2
Gardner's Patent.....ds 35
"Always Ready".....ds 25
Alligator.....ds 25.10
Bey's Patent Wrencher.....ds 25

Winners. For dos
Novelty, for Common Tube, No. 2, 10-inch.....\$ 00.00
Novelty, for Common Tube, No. 3, 11-inch.....\$ 4.50
Excelsior, for Stationary Tube, No. E, 10-inch.....\$ 30.00
Excelsior, for Stationary Tube, No. F, 11-inch.....\$ 45.00
Excelsior, with Folding Bench, No. A, 10-inch.....\$ 48.00
Excelsior, with Folding Bench, No. E, 11-inch.....\$ 55.00
Universal, No. 24.....\$ 30.00
Universal, No. 2.....\$ 35.00
Adams & Co. No. 8.....\$ 30.00
Peerless No. 24.....\$ 30.00
Peerless No. 34.....\$ 34.50
No. 99 Improved.....\$ 35.00
"Metropolitan," No. 2.....\$ 33.00
"Metropolitan," No. 24.....\$ 30.00

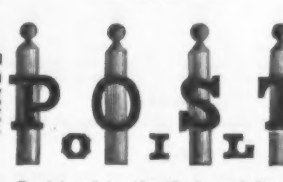
Wrought Staples, Hooks, &c.—See Hooks.

MANUFACTURING CO.
PRODUCERS OF
and Boring Implements,
PRIORS OF
JOHNSON WORKS
Works in America.
A L'HOMMEDIEU IN 1818.
They bear the stamp of "L'Hommedieu"
only trade-marks. Goods bearing these
INGS & CO.,
ST. NEW YORK.
KS OF THE
DWARE COMPANY.
FOUNDRY.

SPECIALTIES.
LO. N.Y.
ENTIRE WORKS
COVERING OVER
THREE ACRES.
ARDS SILVER COMPANY,
PRODUCERS OF
Coffee, Child's, Ice Cream, Berry, Egg,
Sert, Salad, Chow Chow, Pie, Child's, Oyster
Sifters, Preserver Shells, Medium, Dessert,
Julep Strainers, Nut Picks, Combination
Call Bells, all latest patterns, 18 per cent
Light Plate. Also Nickel Silver, Heavy and
Base Brass Light Plated Lily Pattern, &c., &c.
Ladies, &c., bearing our names and trade-mark
are made of Nickel Silver, the best known base
for the use of standard, having been accurately
view to their durability. We hereby authorize the
represented, to return them to us, and we will remit
s, Price List and Discounts.
cial Agents, 77 Chambers St., N. Y.
x 2002.

POST'S

Waterproof Belt Oil and Leather Preservative,

FOR WET AND DRY LEATHER
BELTING.



TRADE MARK

POST

Registered in the U. S. and Great
Britain.

The Standard Belt Oil of the World.

Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

**Beware of Imitations Sold at a
Cheaper Price, the Color of which
is well Calculated to Deceive.**

In their Treatise on Machine Belting,
J. B. HOYT & CO. speak of Post's
Oil as follows:

OILING OF BELTS.

"Care should be taken that belts are kept soft and pliable. For this purpose we decidedly advise the use of **"POST'S WATERPROOF BELT OIL AND LEATHER PRESERVATIVE."** When applied as DIRECTED, it makes the Belt smooth, pliable and adhesive, and causes it to hug the pulley closely, so that no power is lost from lack of pulley contact. It possesses excellent preservative qualities and also renders the leather more impervious to dampness than any article or preparation we know of.

Moisture should not be allowed to penetrate the laps or joints, as it will dissolve the cement and cause the laps to come apart."

ESTABLISHED AGENCIES.

UNITED STATES:

J. B. Hoyt & Co., New York.
J. & H. Phillips, Pittsburgh, Pa.
J. B. Farnum, Woonsocket, R. I.
G. D. Barr, Buffalo, N. Y.
Preston & Nott, Minneapolis Minn.
Post & Co., Cincinnati, Ohio.
J. B. Hoyt & Co., Chicago, Ill.
Langlois & Son, Racine, Wis.
Laurence & Herkner, New York.
Barnum Bros., Troy, N. Y.
Brown Bros. & Co., Providence, R. I.
Jas. H. Billington & Co., Philadelphia, Pa.
Heck & Gregg Hardware Co., Atlanta, Ga.
Covel & Osborn, Fall River, Mass.
J. Ashton & Son, Trenton, N. J.
Geo. A. Smith, Richmond, Va.
W. H. Dillingham & Co., Louisville, Ky.
E. B. Preston & Co., Chicago, Ill.
Cameron & Bartley, Charleston, S. C.
Towner, Landstreet & Co., Baltimore, Md.
C. E. James, Chattanooga, Tenn.
C. B. Choate, East Saginaw, Mich.
R. G. Studley & Co., Grand Rapids, Mich.
Mantle & Cowan, Louisville, Ky.
E. F. Bradford & Co., Cincinnati, Ohio.
The J. LeRoy Pine Co., Troy, N. Y.
H. D. Edwards & Co., Detroit, Mich.
Morley Bros., East Saginaw, Mich.
J. H. & N. A. Williams, Utica, N. Y.
McGowan Bros., San Francisco, Cal.

CANADA:
Robin & Sadler, Montreal.

NEW BRUNSWICK:
R. Chestnut & Sons, Fredericton.

SCOTLAND:
Robert Balderston, Glasgow.

ENGLAND:
O. & W. Ormerod, Rochdale.

**If you cannot get POST'S OIL
from your Belt Maker, send direct to
us and we will see that you do
get it.**

PRICE, PER GALLON, \$1.50

10 gallons,	\$15.00....	boxing and can,	\$1.00.
25 "	37.50.....	no charge for	1/2 Bbls.
50 "	75.00.....	" "	Barrels.

**We solicit Correspondence from
Dealers in Manufacturers' Sup-
plies.**

E. L. POST & CO.,

No. 10 Peck Slip, New York,

SOLE MANUFACTURERS.

WHOLESALE METAL PRICES, October 1, 1884.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 1¢ to 1-10¢ per lb. Railroad Bars weighing more than 25 lb per yard, 7-10¢ of 1¢ per lb.

Standard American Pig Iron.
 Foundry No. 1 X..... ton \$19.50 @ 21.00
 Foundry No. 2 X..... ton 18.00 @ 19.00
 Gray Forge..... ton 17.00 @ 18.00

No. 1 Scotch Pig Iron.
 Cambria..... ton 20.50 @ 21.25
 Colton..... ton 20.00 @ 20.50
 Shotts..... ton 21.00 @ 22.00
 Glasgow..... ton 21.00 @ 22.00
 Gartcharr..... ton 21.00 @ 22.00
 Langloan..... ton 21.00 @ 22.00
 Summerlee..... ton 21.00 @ 22.00
 Dalmellington..... ton 21.00 @ 22.00
 Eglinton..... ton 21.00 @ 22.00
 Clyde..... ton 21.00 @ 22.00

Rails.
 Steel, at Eastern mills..... ton 27.50 @ 28.00
 Old Rails, T..... ton 17.00 @ 18.00

Scrap.
 Wrought, per ton, from yard..... 10.00 @ 30.00

Bar Iron from Store.

Common Iron:
 1 to 1 in. round and square..... \$ 1.90 @ 2.00

Refined Iron:
 1 to 1 in. round and square..... \$ 2.00 @ 2.10

1 to 1 in. x 1/2 in. flat..... \$ 2.10 @ 2.20

1 to 1 in. x 1/2 in. flat..... \$ 2.20 @ 2.30

1 to 1 in. x 1/2 in. flat..... \$ 2.30 @ 2.40

1 to 1 in. x 1/2 in. flat..... \$ 2.40 @ 2.50

1 to 1 in. x 1/2 in. flat..... \$ 2.50 @ 2.60

1 to 1 in. x 1/2 in. flat..... \$ 2.60 @ 2.70

1 to 1 in. x 1/2 in. flat..... \$ 2.70 @ 2.80

1 to 1 in. x 1/2 in. flat..... \$ 2.80 @ 2.90

1 to 1 in. x 1/2 in. flat..... \$ 2.90 @ 3.00

1 to 1 in. x 1/2 in. flat..... \$ 3.00 @ 3.10

1 to 1 in. x 1/2 in. flat..... \$ 3.10 @ 3.20

1 to 1 in. x 1/2 in. flat..... \$ 3.20 @ 3.30

1 to 1 in. x 1/2 in. flat..... \$ 3.30 @ 3.40

1 to 1 in. x 1/2 in. flat..... \$ 3.40 @ 3.50

1 to 1 in. x 1/2 in. flat..... \$ 3.50 @ 3.60

1 to 1 in. x 1/2 in. flat..... \$ 3.60 @ 3.70

1 to 1 in. x 1/2 in. flat..... \$ 3.70 @ 3.80

1 to 1 in. x 1/2 in. flat..... \$ 3.80 @ 3.90

1 to 1 in. x 1/2 in. flat..... \$ 3.90 @ 4.00

1 to 1 in. x 1/2 in. flat..... \$ 4.00 @ 4.10

1 to 1 in. x 1/2 in. flat..... \$ 4.10 @ 4.20

1 to 1 in. x 1/2 in. flat..... \$ 4.20 @ 4.30

1 to 1 in. x 1/2 in. flat..... \$ 4.30 @ 4.40

1 to 1 in. x 1/2 in. flat..... \$ 4.40 @ 4.50

1 to 1 in. x 1/2 in. flat..... \$ 4.50 @ 4.60

1 to 1 in. x 1/2 in. flat..... \$ 4.60 @ 4.70

1 to 1 in. x 1/2 in. flat..... \$ 4.70 @ 4.80

1 to 1 in. x 1/2 in. flat..... \$ 4.80 @ 4.90

1 to 1 in. x 1/2 in. flat..... \$ 4.90 @ 5.00

1 to 1 in. x 1/2 in. flat..... \$ 5.00 @ 5.10

1 to 1 in. x 1/2 in. flat..... \$ 5.10 @ 5.20

1 to 1 in. x 1/2 in. flat..... \$ 5.20 @ 5.30

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1 to 1 in. x 1/2 in. flat..... \$ 5.60 @ 5.70

1 to 1 in. x 1/2 in. flat..... \$ 5.70 @ 5.80

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1 to 1 in. x 1/2 in. flat..... \$ 6.50 @ 6.60

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1 to 1 in. x 1/2 in. flat..... \$ 6.70 @ 6.80

1 to 1 in. x 1/2 in. flat..... \$ 6.80 @ 6.90

1 to 1 in. x 1/2 in. flat..... \$ 6.90 @ 7.00

1 to 1 in. x 1/2 in. flat..... \$ 7.00 @ 7.10

1 to 1 in. x 1/2 in. flat..... \$ 7.10 @ 7.20

1 to 1 in. x 1/2 in. flat..... \$ 7.20 @ 7.30

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1 to 1 in. x 1/2 in. flat..... \$ 7.50 @ 7.60

1 to 1 in. x 1/2 in. flat..... \$ 7.60 @ 7.70

1 to 1 in. x 1/2 in. flat..... \$ 7.70 @ 7.80

1 to 1 in. x 1/2 in. flat..... \$ 7.80 @ 7.90

1 to 1 in. x 1/2 in. flat..... \$ 7.90 @ 8.00

1 to 1 in. x 1/2 in. flat..... \$ 8.00 @ 8.10

1 to 1 in. x 1/2 in. flat..... \$ 8.10 @ 8.20

1 to 1 in. x 1/2 in. flat..... \$ 8.20 @ 8.30

1 to 1 in. x 1/2 in. flat..... \$ 8.30 @ 8.40

1 to 1 in. x 1/2 in. flat..... \$ 8.40 @ 8.50

1 to 1 in. x 1/2 in. flat..... \$ 8.50 @ 8.60

1 to 1 in. x 1/2 in. flat..... \$ 8.60 @ 8.70

1 to 1 in. x 1/2 in. flat..... \$ 8.70 @ 8.80

1 to 1 in. x 1/2 in. flat..... \$ 8.80 @ 8.90

1 to 1 in. x 1/2 in. flat..... \$ 8.90 @ 9.00

1 to 1 in. x 1/2 in. flat..... \$ 9.00 @ 9.10

1 to 1 in. x 1/2 in. flat..... \$ 9.10 @ 9.20

1 to 1 in. x 1/2 in. flat..... \$ 9.20 @ 9.30

LEAD.—Duty: Pig, \$2 per 100 lb.; Old Lead, 3¢ per lb.; Pipe and Sheet, 3¢ per lb.

American..... 4 @ 4.12 1/2

Pipe..... 4 @ 4.12 1/2

Block Tin Pipe..... 15¢, dis 20

Tin Lined Pipe..... 15¢, dis 20

Sheet..... 6¢, dis 20

Shot..... Drop, 6¢; Buck, 7¢

Chilled Shot..... 7¢

ANTHONY.

Hallett's..... 11 @ 11 1/4

Cookson..... 11 @ 11 1/4

SPELTEN.—Duty: Pigs, Bars and Plates, \$1.50

per 100 lbs.

American, cash..... 4 1/2 @ 5 1/4

Bergerport..... 4 1/2 @ 5 1/4

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet, 5¢ per lb.

600 lb casks..... 5.50 @ 5.50 1/2

Zinc, Open..... 6 @ 6 1/2

Zinc Tubing..... dis. 10 @ 20

Zinc Tubing.—Dis. 25.

Plain..... 37

Fancy..... 38

Scotch and Extra Patterns..... 38

HARRITT METAL.

N. P. U..... 7 @ 7.50

A. S. B. 2¢; C. 1 1/4¢.

WIRE.

Iron Wire.—Put up in 60 lb bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 12 13 14 15 16 17 18

Bright Market Wire..... dis 65

Charcoal..... dis 65

Bale Wire, Nos. 7 to 12..... dis 65

Annular Market Wire..... dis 65

Fence Wire, Nos. 8 and 9..... dis 65

Grape Wire, Nos. 10 to 14..... dis 65

Bessemer Steel Wire..... dis 65

Coppered Market Wire..... dis 65

Bale Wire, Nos. 7 to 12..... dis 65

Galvanized Market Wire..... dis 65

Fence Wire..... dis 65

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26

Cents..... 14 15 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36

Cents..... 27 28 29 30 31 32 33 34 35 36

Nos. 37 38 39 40 41 42 43 44 45 46

Cents..... 37 38 39 40 41 42 43 44 45 46

Nos. 47 48 49 50 51 52 53 54 55 56

Cents..... 47 48 49 50 51 52 53 54 55 56

Nos. 57 58 59 60 61 62 63 64 65 66

Cents..... 57 58 59 60 61 62 63 64 65 66

Nos. 67 68 69 70 71 72 73 74 75 76

Cents..... 67 68 69 70 71 72 73 74 75 76

Nos. 77 78 79 80 81 82 83 84 85 86

Cents..... 77 78 79 80 81 82 83 84 85 86

Nos. 87 88 89 90 91 92 93 94 95 96

Cents..... 87 88 89 90 91 92 93 94 95 96

Nos. 97 98 99 100 101 102 103 104 105 106

Cents..... 97 98 99 100 101 102 103 104 105 106

Nos. 107 108 109 110 111 112 113 114 115 116

Cents..... 107 108 109 110 111 112 113 114 115 116

Nos. 117 118 119 120 121 122 123 124 125 126

Cents..... 117 118 119 120 121 122 123 124 125 126

Nos. 127 128 129 130 131 132 133 134 135 136

Cents..... 127 128 129 130 131 132 133 134 135 136

Nos. 137 138 139 140 141 142 143 144 145 146

Cents..... 137 138 139 140 141 142 143 144 145 146

Nos. 147 148 149 150 151 152 153 154 155 156

Cents..... 147 148 149 150 151 152 153 154 155 156

Nos. 157 158 159 160 161 162 163 164 165 166

Cents..... 157 158 159 160 161 162 163 164 165 166

Nos. 167 168 169 170 171 172 173 174 175 176

Cents..... 167 168 169 170 171 172 173 174 175 176

Nos. 177 178 179 180 181 182 183 184 185 186

Cents..... 177 178 179 180 181 182 183 184 185 186

Nos. 187 188 189 190 191 192 193 194 195 196

Cents..... 187 188 189 190 191 192 193 194 195 196

Nos. 197 198 199 200 201 202 203 204 205 206

Cents..... 197 198 199 200 201 202 203 204 205 206

Nos. 207 208 209 210 211 212 213 214 215 216

Cents..... 207 208 209 210 211 212 213 214 215 216

Nos. 217 218 219 220 221 222 223 224 225 226

Cents..... 217 218 219 220 221 222 223 224 225 226

Nos. 227 228 229 230 231 232 233 234 235 236

Cents..... 227 228 229 230 231 232 233 234 235 236

Nos. 237 238 239 240 241 242 243 244 245 246

Cents..... 237 238 239 240 241 242 243 244 245 246

Nos. 247 248 249 250 251 252 253 254 255 256

Bogus Manillas and Hardwares..... 1/2 @ 1

Common, per 100 lb..... 60 @ 70

Students' Board Cuttings, per cwt..... 70 @ 75

Straw Board Cuttings, per cwt..... 70 @ 75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'..... \$ 22 @ 24

Ivory Drop, fair..... 12 @ 15

Black Paint, in oil, No. 1, kgs, 8¢; assorted cans, 11¢

Blue, Prussian, fair to best..... 40 @ 55

Chinese dry..... 40 @ 55

Ultramarine..... 18 @ 30

Brown, Spanish..... 14 @ 25

Green Chrome..... 14 @ 25

Paris..... 14 @ 25

Iron Paint, Bright Red..... 14 @ 25

Brown..... 14 @ 25

Ground in oil, Bright Red..... 14 @ 25

Red..... 14 @ 25

Purple..... 14 @ 25

Mineral Paints..... 14 @



GOLDEN STAR LAMP STOVE.

Cheap and Powerful Light.
CHEAP FUEL.

We offer the trade a very superior Lamp Stove. The Golden Star Lamp Stove gives a powerful light, has a burner 4 inches wide. As a lamp it is very efficient and convenient. For light cooking the Golden Star is invaluable. Its uses are many, being almost indispensable for use in the Nursery, Camp, Boarding House, &c. The Golden Star is absolutely first class in every respect. Our improved manner of making the Oil Reservoir prevents any possibility of the lamp tipping or sloping of the oil. The Golden Star has a permanent and convenient handle, an improvement that is appreciated. Price \$2 Each.

For Full Particulars, Discounts, &c., Address,
MYERS, OSBORN & CO.,
CLEVELAND, OHIO.
Manufacturers of
STOVES AND RANGES.
Also the Celebrated Golden Star Oil Stoves, Oil Ranges and Gasoline Stoves.

The F. F. ADAMS COMPANY, Erie, Pa.

THE LATEST THING OUT.



IDEAL MOUSE TRAP.

So perfectly simple in construction there is nothing to get out of order, as is the case with all other traps made on this principle. Guaranteed to give perfect satisfaction. Send for sample gross and you will not have any other trap that catches mice alive. The inventor of the Ideal invented all of the leading traps in the market to-day, and he says this one is perfect. Great care is taken in the manufacture of the Ideal, and every trap is perfect. A single trap for inspection will be sent by mail upon receipt of 20c. in stamps.

The Cyclone Mouse Trap.

We invite the attention of dealers to this "Novelty" in Mouse Traps. Patented Nov. 5, 1883, and now having an immense sale. It is cheap, durable and attractive, and so sensitive that the mouse who ventures to touch his nose to the bait box is doomed. Our salesmen on the road say it is the most popular trap ever offered to the trade. One of our men in a single short trip sold 10,000. The retail price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail for inspection, upon receipt of five 2-cent stamps. Send for our Illustrated Catalogue.



Please Mention this Paper.

NIAGARA STAMPING AND TOOL CO.

MANUFACTURERS OF

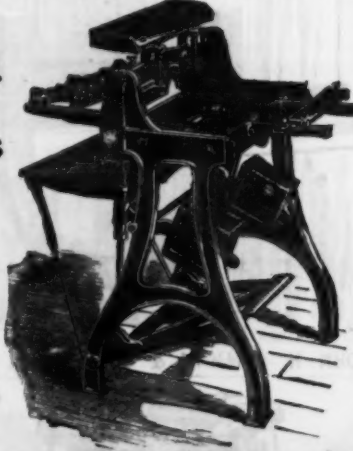
PRESSES, DIES & TOOLS

For working Sheet Metal,
Fruit Can Dies and Tools,
Canners' Outfits,
Squaring Shears, &c.

P. S. & W. CO.'S
TINNERS' TOOLS AND MACHINES.

147 and 149 Elm St., BUFFALO, N. Y.

Write for our Catalogue and Price List.



G. A. CROSBY & CO.

MANUFACTURERS OF

Presses, Dies,

AND

Special Machinery

FOR

Sheet Metal Workers.

Market and
RANDOLPH ST.
Chicago, Ill.

TOWER (Donohue's Patent) ENGINEER'S WRENCH.

10, 12 AND 15 INCH.



A Combined Nut and Pipe Wrench. The Strongest Wrench Made.

TOWER & LYON, 96 Chambers Street, NEW YORK, U. S. A.

THE LONG & ALLSTATTER CO., Hamilton, Ohio,

Cor. 4th and High Streets.

PUNCHES, SHEARS AND HAMMERS.

Double, Single, Horizontal, Twin Roller, Spacing Gate, Multiple Angle, Bar, &c. Belt and Steam Driven

Send for Catalogue.

PENN LOCK WORKS.

NICKEL-PLATED
Steel Key Blanks
OF EVERY DESCRIPTION.

G. W. NOCK,

142 N. Fourth Street,
PHILADELPHIA, PA.

The Lesson of the Suez Canal.

The report of Prof. J. E. Nourse, of the Navy Department, on the Suez Canal has just been issued from the Government Printing Office. It contains, says the New York Times, a very full history of the enterprise and an account of its present condition and prospects, which are extremely interesting and instructive. Little of the information is absolutely new, but it is drawn from a great variety of sources, and is for the first time presented in full to American readers. The cost of the canal is set down at about \$95,000,000, but it was greatly enhanced by the exceptional obstacles thrown in the way, chiefly through the interference of the British Government, and it could be duplicated now for two-thirds of the outlay. The state of the capital account in 1882 was 397,438 shares of 500 francs each; 301,848 obligations of 500 francs each, issued at 300 francs, bearing interest at 5 per cent. and redeemable at par; 83,993 obligations of 500 francs, bearing 5 per cent. interest; 99,990 30-year bonds of 125 francs, at 8 francs interest per annum; 15,152 bonds of 500 francs, at 3 per cent., and 399,765 bonds of coupons of 85 francs each, bearing 5 per cent. interest, besides 100,000 founders' shares, with right to participate in surplus profits under certain conditions. Of the shares, 176,602 formerly belonged to the Khédive of Egypt, but were purchased by the British Government in 1875. The dividends upon these were alienated to the company until 1894, and against these 120,000 obligations have been issued, entitled to all sums accruing to the shares, less an annual amount set aside for a sinking fund to extinguish them in 1894. Of net earnings in excess of 5 per cent. on the shares, 15 per cent. goes to the Egyptian Government, 10 per cent. to founders' shares, 2 per cent. to an invalid fund for employees, 2 per cent. to the managing directors, and 71 per cent. to regular shareholders.

The success of the canal is shown in a progressive increase of traffic and receipts, until in 1883 the number of vessels passing through were 3307; net tonnage, 5,775,861; receipts, 68,512,064 francs. The net profits for that year were 35,863,541.26 francs, of which 12,676,056.33 francs were reserved for improvements, leaving 23,187,484.93 francs applicable to dividends. Of the traffic more than three-fourths was English. Two important movements have been on foot in the last two years—one for a reduction of tolls, pressed chiefly by the English Government, and one for an increase of the capacity of the canal. With a view to this latter object three plans have been proposed—first, for doubling the width of the present canal; second, for constructing another by its side, and, third, for constructing another on a new line. The first is understood to have been definitely adopted. Out of the very full details given of everything connected with the construction and operation of the canal the prominent fact emerges that it has been in every sense a great success. In spite of all drawbacks, it has proved very profitable to the company, but its indirect benefits in the saving of time and distance and the increase of commerce are hardly calculable. It has led to the organization of new lines of steamships and the increase of the fleets of old ones, thereby stimulating the shipbuilding interest, as well as enlarging the volume of commerce between Europe and the East.

Professor Nourse very naturally leads up from his study of this great enterprise to a consideration of the importance and feasibility of a canal across the American isthmus. The advantages to accrue would not, in his opinion, be less, while the share of this country in them would be very great. It practically amounts to nothing in the Suez Canal. Of the 3307 vessels passing through it last year only one was American. The problem of piercing the American isthmus is much more serious than that encountered at Suez on account of the nature of the country to be traversed. Professor Nourse considers the various routes, and practically eliminates all except those of Nicaragua and Panama. He gives no consideration to the political aspect of the question, but suggests that the time has come "when a choice should be made between the commencement of work on a separate line and a participation by capitalists in the one now under way." The inference is that unless the United States Government is prepared to promote the project in some form for canal at Nicaragua it should take steps to secure a share and an influence in enterprise at the Panama similar to that which the British Government has obtained at Suez. This is distinctly intimated in a footnote to the report, and in the text it is suggested that if a commission should "visit the two lines, the Nicaragua and the Panama, in company with a committee of Congress, important results, it is believed, must ensue." In the discussion of these two lines and what has been done at Panama nothing distinctly appears to aid in solving the question. The choice is apparently regarded as an open one, to be decided on investigation, but Professor Nourse leaves no doubt of his own conviction that there should be a canal across the American isthmus, and that the United States should exercise a dominant influence over its operation.

International Time Standard.

Nearly all the Governments which have been invited by the United States to send representatives to the International Meridian and Time Standard Conference, to be held at Washington this week, have accepted and named their delegates. The number of delegates from each Government is limited to five. None are expected to send the full number. The American delegates are Rear-Admiral C. R. P. Rodgers, chairman of the delegation; Prof. Cleveland Abbe, Commander W. T. Sampson, United States Navy; Lewis M. Rutherford and W. T. Allen. The delegates from Great Britain are Capt. Sir F. J. O. Evans, R. N.; Prof. J. C. Adams, Lieutenant-General Strachey and Sandford Fleming. France will send M. A. Lefebvre, consul-general at New York, and

M. Janssen. Austria will be represented by the Baron Ignatz von Schaeffer.

Prof. F. A. P. Barnard, president of Columbia College, was the original appointee for chairman of the American delegation, but was obliged to resign on account of a pressure of college duties. As to the probable position of the standard meridian to be chosen, President Barnard expresses the

sufficiently reduced in size to admit of its being carried in the vest or other small pocket, and without the bulk or weight common to other effective revolvers. It is represented about full size in the cut. It will be perceived that the form of the hammer is such that it can be carried in the pocket without wear or liability of catching when inserted or suddenly withdrawn. As indi-



The Vest-Pocket Self-Cocker.

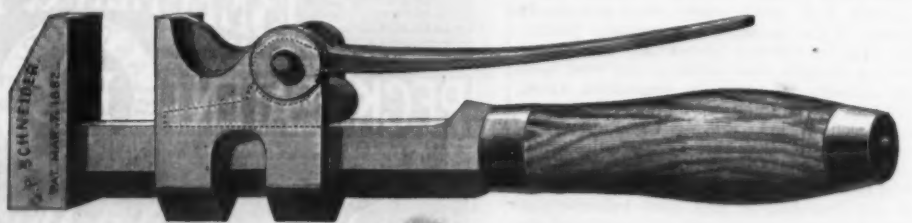
opinion that the meridian of Greenwich will be selected, as its adoption would necessitate a minimum of changes in existing systems. The action of the delegates will not, however, be binding upon the powers represented, and will require the ratification of the several Governments. It is considered not impossible that there may be some reluctance on the part of France to accept the meridian of her great maritime rival. President Barnard, however, does not think that this would prove to be a serious check upon the proceedings of the conference. He said that last year, at a non-official geodetic congress held at Rome, the adoption of the meridian of Greenwich as the zero had been recommended. The French delegates then offered to accept the Greenwich standard on the condition that the other nations would accept the metric system of weights and measures.

Recent European dispatches indicate the probability of this question coming up for serious consideration, France being disposed to press the matter. When asked whether the congress would probably abolish the old system of computing longitude east and west from the prime meridian, through 180°, and substitute a method of reckoning longitude in one direction only, through the 360°, President Barnard stated that the object of the conference was to establish a prime meridian, and that in his judgment the object only should be accomplished, and that other questions and details should not be considered. This, he thought, would also be the opinion of the congress. The conference will meet in the diplomatic rooms of the Department of State. The Government has made an appropriation of \$5000 for necessary expenses, but the American delegates receive no compensation.

HARDWARE NOVELTIES.

Schneider's Patent Lever Monkey Wrench.

An illustration of this article is herewith given, which indicates in a general way its construction and method of operation. The Wrench was patented by George P. Schneider, of Cleveland, Ohio, March 7, 1882, and is now for the first time made by Schneider & Beckett, Hamilton, Ohio. The principle on which this wrench works is that the sliding jaw is held firmly by a wedge, this wedge being forced between the upper portion of the sliding jaw and the shank by means of an eccentric, and being withdrawn in a similar manner by a reverse action. The manufacturers call attention to facility with which the wrench is thus adjusted, as by simply lifting the lever the sliding jaw can be instantly moved the whole length of the shank. They claim



Schneider's Lever Monkey Wrench.

also that it has greater power than other wrenches, for when the lever is placed down the wedge holds the sliding jaw firmly, preventing its slipping. They mention also the advantages that result from the fact that there is no ratchet movement to break or slip, and no thread to strip and become clogged and immovable under rough usage. The various parts of this wrench are made interchangeable, and the pieces being numbered, they can be readily ordered and the wrenches thus easily repaired. On this account the manufacturers claim that this wrench is especially durable. It is made at present 10 and 12 inches.

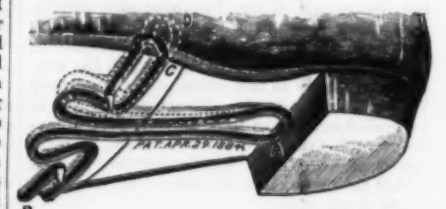
The Vest-Pocket Self-Cocker.

The illustration given on another part of this page represents the article named above, a Revolver which has just been put on the market by Harrington & Richardson, Worcester, Mass., for whom Showerling, Daly & Gales are agents, 84 and 86 Chambers street, New York. The novelty in this pistol is not in the mechanism, but rather in the pattern, being designed to meet the demand for a small, compact, powerful shooting pistol,

cated in the name, it is a self-cocker, but it is not a double-action. It is intended for 32 central-fire cartridges. The list price of this article is \$4, at which figure it can be retailed.

A New Ice Creeper.

C. F. West, 1940 Columbia avenue, Philadelphia, is the patentee and manufacturer of the Steel Wire Ice Creeper represented in the illustration given herewith, where it is shown attached to the boot of the wearer. It is constructed, as will be seen, of one piece of steel wire bent in the shape represented in the cut, the method of attachment being also indicated. The creeper is spread open sufficiently to make it grasp the sole of the boot at B and D, as indicated, the spring of the wire holding it securely in front, while the end A has a small point or spur on it, which enters slightly into the heel, thus keeping the creeper in place, and prevents it from moving backward. The edges of the



West's Steel Wire Ice Creeper.

creeper at D and B, which grasp the sole, are slightly roughened on the inside, so as to give them a secure hold and prevent the creeper from moving forward. This roughening is, however, very slight, so as not to mar the sole nor to injure rubbers in case it is used with them. That it may be used with rubbers is one of the points made in its favor. This article is certainly very readily attached, and seems to be quite secure. It is made in three sizes—for ladies, No. 1; for gents, Nos. 2 and 3—but from the fact that the creeper admits of so wide a range of adjustment, it is said, that the No. 2 will do for all gents' boots except extremely large sizes. Sise, Gibson & Co., 100 Chambers street, are agents in this city.

Green & Pitt, Mincing Lane, London, report that the periodical sales of shells were held on September 10. The attendance of buyers was rather sparse. In no instances were prices higher, but a fair general demand prevailed. The assortment and demand were as follows: Mother-of-pearl shells.—Of 583 packages Sydney all except about 50 were placed, showing no change in values. Of black-edged there were 204 cases, the whole of which were retired,

there being no apparent demand. Out of 453 bags Panama some three-fourths sold at 50/ to 52/ per cwt. for fair, and 58/ for selected. Of Bombay there were about 460 cases, but only half sold. Mussell shells sold very firmly. Of 547 packages three-fourths sold—large at 58/ to 62/6, and medium 43/ to 47/.

The following table, compiled by the Engineering News, shows the different gauges of railways on this continent and the number of roads or systems and the approximate mileage of each gauge:

Gauge.	Roads or systems.	Mileage.
5 feet 6 inches.....	2	38
5 feet 3 inches.....	2	76
5 feet 2 inches.....	1	8
5 feet.....	1	8
4 feet 9 1/2 inches.....	47	11,478
4 feet 9 inches.....	1	57 1/2
4 feet 8 1/2 inches.....	35	11,131
4 feet 8 1/4 inches.....	8	1,220
4 feet 8 1/8 inches.....	39	98,649
4 feet 7 1/2 inches.....	3	75
4 feet 7 inches.....	1	8
3 feet 6 inches.....	9	514
3 feet 4 inches.....	1	9
3 feet 2 inches.....	1	48
3 feet.....	100	8,672
2 feet.....	8	34

Co-operation in England.

The Wholesale Co-operative Society celebrates this year, at Manchester, England, its 21st anniversary. This society has been wonderfully successful, as is shown by the following statement made by a Manchester correspondent of the *London Times*: "The partnership comprises about half the retail stores in the Kingdom. In proportion to their number of members, they hold its shares. Last year's share total was £186,692. Some stores have also lent it money. It has more loan capital than it can yet use (total, \$450,000). On the other hand, it has investments of its own in the capital of the co-operative societies. It owns freehold land, buildings, steamers; it has been purchasing depots in America and on the Continent; it has a banking department, and many supply stores. Its committee of directors report quarterly to meetings of delegates, generally some 300 in number. Its profits are divided among the stores which constitute the partnership, and in a less degree among other customers. Originally founded in Manchester, it has important branches in London and Newcastle. It has workshops at Leicester, Hockmowick and elsewhere. In all these things it is expected to multiply." Arguing from the rate of progress indicated by the facts that the membership of co-operative societies in the United Kingdom has multiplied seven-fold since 1861, their capital seventeen-fold, and their profits twelve-fold, the advocates of the cause avow their belief that before the end of the century the working classes will have the staple trades of the country entirely in their own hands or under their own control.

Pensioning Employees.—The Baltimore and Ohio Railroad, observes an exchange, have made a contribution in aid of their employees, in the shape of the payment of the yearly interest on \$500,000 at 5 per cent. This is \$25,000 a year, and is to be specially devoted to establishing a system of pensions to be paid employees incapacitated by any cause from earning a living. Those who have been in the service 10 or more years, or who at 65 retire from active duty, secure the advantage of the new order of things, as also those whom the company may retire at 60, or who in the contraction of infirmities become unable to perform the service assigned to them, or of securing a livelihood in other pursuits. Incapacity by reason of accident or sickness is already provided for in the old-established features of the association, which in four years has already paid employees and their families \$686,000. The advantages accruing under the operations of the life-insurance provisions of the organization are not affected by the pension payments, being protected in plain terms, and thus continuing to the employee's family in the certainty of monetary help in case of death. The pensions are to be scaled according to the grade in employment and the longevity allowance, being 1 per cent. for each year's service, and is added to the pension of those who serve upward of 10 years.

The Telephone in Russia.—Although the telephone has become an established fact in several of the largest Russian cities, as St. Petersburg, Moscow, Odessa, Riga and Warsaw, it is making but little progress elsewhere in the country. St. Petersburg itself is traversed in every part by at least 1500 wires (nearly 1000 miles) of wire on the Bell system. The works and factories in the quarters of Viborg, Krestovsky and Old Petersburg are all in connection with the central portion of the city, as are also the great Government offices with the barracks, police courts and prisons, so that orders from headquarters can be instantaneously communicated and carried out. The wires now extend to the fortresses of Gatchina and Peterhof, and the large smelting works of Putilov and Alexandrovsky, some 8 or 10 versts distant, correspond directly with the Nevsk Perspective and the Morikafa. An office has been opened for the public, who can send a message for 25 copecks (about 18 cents.)

The Origin of Coal.—Mr. G. W. Froggatt writes a letter to the *Australasian*, in which he directs attention to a statement made by Dr. Taylor, to the effect that an interesting side-light has been thrown on the origin of coal by a paper read before the Geological Society by Mr. Wethered, who showed that some coals were practically made of the spores of cryptogamic plants. Dr. Taylor further stated that nobody has before thought that some of our coal beds are actually due to similar vegetation which grew in the swamps and marshes of the carboniferous period. But Mr. Froggatt writes, in reference to this, that he was quite under the impression that it was an established fact that the origin of a very large number of the best known and most valuable coal beds in Great Britain and other parts of the world was due to the sporangia and spores of cryptogamic plants nearly allied to the club-moss and other similar plants. The object of Mr. Froggatt's letter is apparently to show that Mr. Wethered is by no means the originator of the "sacculus" theory of coal formation.

Large Horizontal Boring Machine.—Messrs. Heatherington & Co., of Manchester, England, are constructing, for one of the French shipbuilding yards, an exceptionally large horizontal boring machine for marine work. The machine is specially arranged for boring out marine-engine cylinders; the boring-bar is driven by a powerfully-gearred headstock having combination spin and worm gearing, which has been specially arranged to lighten the work on the worm and wheel. The bar is provided with two double-facing blocks, capable of facing cylinder flanges up to 9 feet diameter, and the facing tools are self-acting by means of star-wheels and catches. The height of center is 5 feet, the diameter of boring-bar 13 inches, and length, 22 feet; the bar is provided with a sleeve upon which are mounted boring-heads to suit different diameters of cylinders, as required, up to 7 or 8 feet in diameter. The boring-head is automatically fed by variable gearing; there is also a provision for adjustment by hand. The bed of the machine is 23

feet in length by 7 feet in width, and is provided with convenient slots for holding the work. The total weight of the machine is about 25 tons.

The introduction of machine-made horse nails into England, says the *Ironmonger*, dates back some 10 or 12 years, and they have taken a firm hold upon the market, but it is a noticeable fact that English manufacturers have been very backward in developing this trade, and have hitherto allowed it to remain to a great extent in the hands of American and Continental competitors. Much as we appreciate all improvements in manufactures, especially such as give a better article at smaller cost, we must all regret to see trade going away from our own country, and we are glad to note that extensive works for the manufacture of horse nails have just been started very close to the old seat of the hand-made horse-nail trade. The works we refer to are those of the Whitington Patent Horse Nail Company, at Kniver, near Stourbridge, with the very suggestive and thoroughly English trade-mark, "Newmarket." It is stated that the nails are being manufactured from the very best brands of Swedish charcoal iron.

The "blue earth" of Samland—the most important source of the amber supply—extends along the Baltic for 60 miles, and possesses a breadth of about 12 miles and an average thickness of 10 feet. Ruge estimates that every 12 cubic feet of this earth contains a pound of amber. This gives a total of some 9,600,000,000 pounds, which, at the present rate of quarrying, is sufficient to last for 30,000 years. Amber is the fossilized gum of trees of past ages, and, on the supposition that these trees had the same resin-producing capacity as the Norway spruce, and that the amber was produced on the spot where it is now found, Geopert and Monge, in a new German work, estimate that 300 forest generations of 120 years each must have grown on the Samland blue earth to give it its present richness in the product.

The following table shows a steady increase in the consumption of steel for rails in France, with a steady decrease in the use of iron, the extinction of which for the permanent way of the railroad system is only a question of a short time.

Years.	Iron rails.	Steel rails.	Total.
	Tons.	Tons.	Tons.
1873.....	135,000	85,000	220,000
1874.....	154,000	108,000	262,000
1875.....	104,000	135,000	249,000
1876.....	57,000	161,000	218,000
1877.....	53,000	171,000	224,000
1878.....	50,000	211,000	261,000
1879.....	39,000	231,000	270,000
1880.....	38,000	292,000	330,000
1881.....	38,000	290,000	328,000
1882.....	27,000	250,000	277,000

San Francisco papers notice large shipments by the Pacific Mail steamers of supplies for the French navy on the Asiatic coast. The steamer of September 14 had 13,735 barrels of flour, 236 packages of provisions, 310 packages of machinery and \$1,000,000 in treasure. The next two steamers have their cargoes fully engaged.

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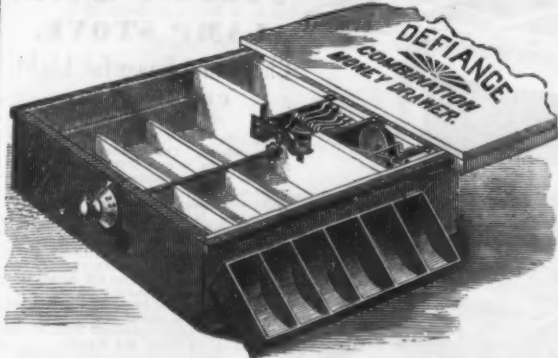
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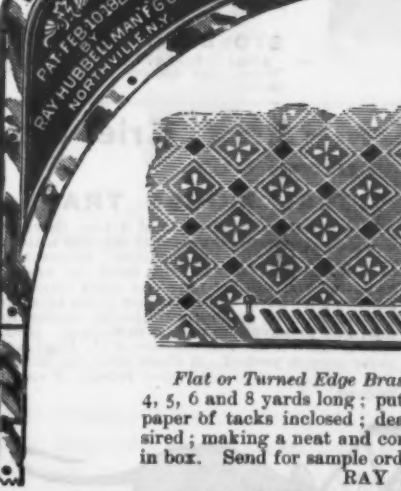
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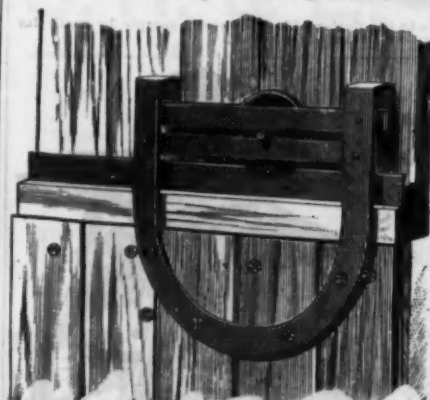
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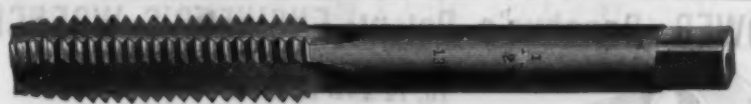


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(Protected by and Manufactured under U. S. Patents) 3 Size (Screw Style) Improved balances, large, medium and small, of malleable and gray iron and solid bronze. Other patented styles also made, with and without the Hugunin patent locking attachment. Simplicity and efficiency, combined with honestly-made goods, enable a guarantee of satisfaction for all genuine improved balances; and all genuine have "Robt. B. Hugunin, Patentee and Sole Authorized Maker" cast directly upon them with the dates of his patents on the boxes containing them. The 1877 unimproved and unrecommended (screw style) I still sell at half price of improved. This old style has been fraudulently copied, the copier using his name and the date of one of my minor patents, Nov. 6, 1877—he having no patent—and backing same with the name of a high-sounding but feeble company, and with help of dealers in "sawdust" and "dead beats" and "swindlers," aided by circulars and canvassing and misrepresentations, has succeeded in placing some of the bogus goods, to the injury and loss of the unsuspecting user. I am in daily receipt of complaints, and advise those who have been swindled to keep their evidence till settlement day comes round. HUGUNIN SASH LOCKS ARE THE FAVORITE. Goods delivered in New York free. I have no agent in New York; any pretending to be such are scoundrels. Lowest price guaranteed. Address orders, &c., to
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Complete outfits for Actual Workshop Business. Lathes for Wood or Metal. Circular Saws, Scroll Saws, Formers, Mortisers, Tenoners, &c., &c. Machines on trial if desired. Descriptive Catalogue and Price List Free.
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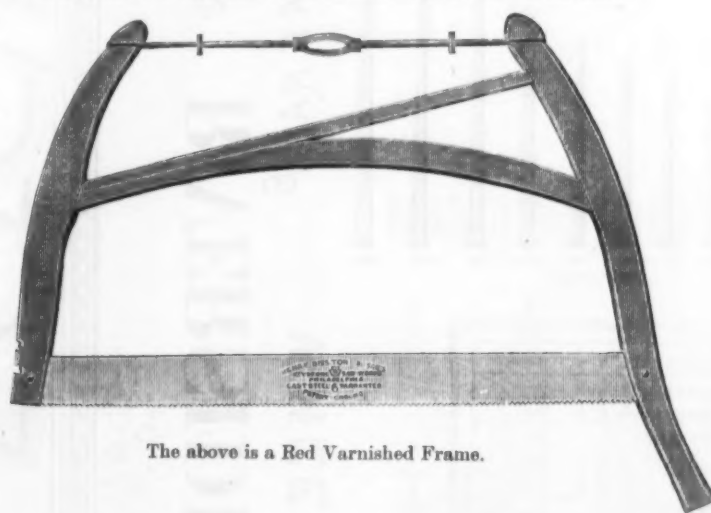
KEYSTONE SAW, TOOL, STEEL AND FILE WORKS, PHILADELPHIA, PA.

"BOSTON FRAMED" WOOD SAW, No. 50.
With No. 6 Round-Breasted Blade, Thin Back.



The above is a Red Varnished Frame.

"ELECTRIC," No. 40,
With No. 6 Round-Breasted Blade, Thin Back.



The above is a Red Varnished Frame.

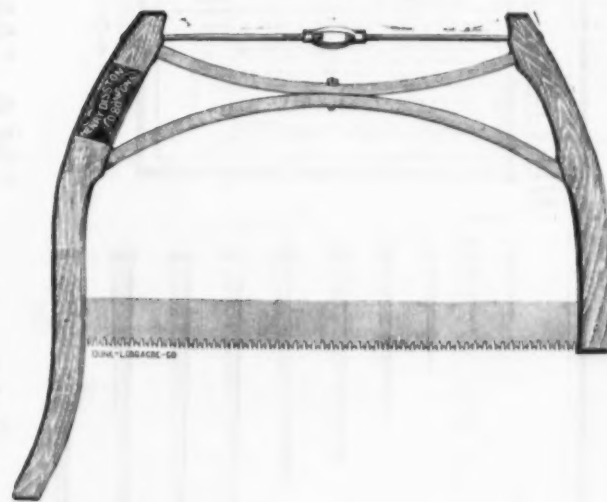
"CLIMAX," OR No. 60.
With Regular No. 6 Blade.



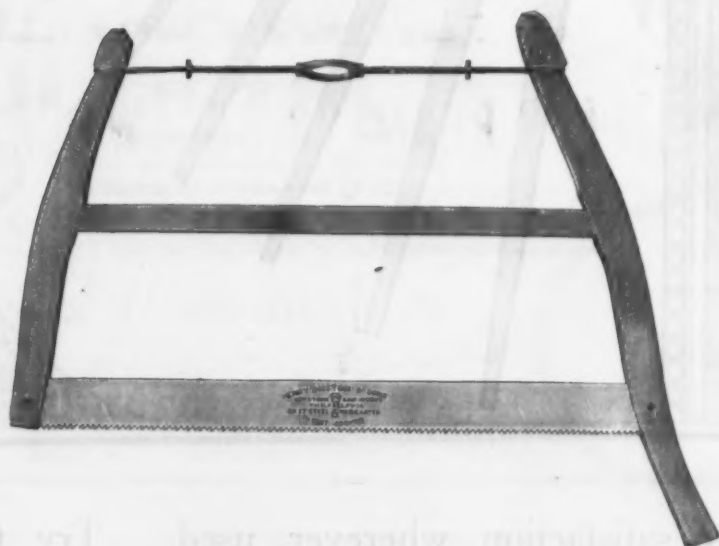
"DISSTON'S" No. 6,
With Regular No. 6 Blade, furnished either with
Straight or Clipper Rods.



"BRACE FRAME," No. 80.
With No. 77 Blade.



"BOSTON" FRAME,
With Regular No. 6 Blade.



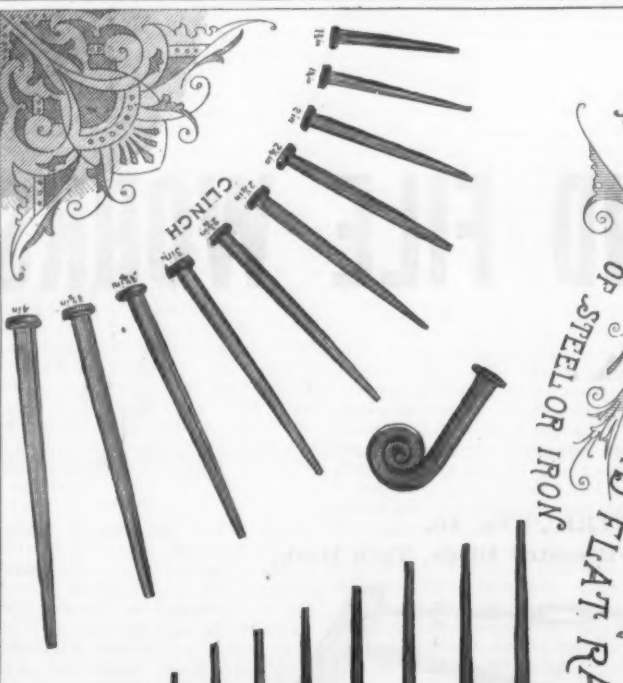
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Regular Plain Tooth.



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NAILS MADE TO ANY PATTERN.

Size	Weight	Length	Width	Thickness	Area	Volume	Weight
1/4"	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3/8"	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1/2"	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5/8"	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3/4"	5.0	5.0	5.0	5.0	5.0	5.0	5.0
7/8"	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1"	7.0	7.0	7.0	7.0	7.0	7.0	7.0
1 1/8"	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1 1/4"	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1 3/8"	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1 1/2"	11.0	11.0	11.0	11.0	11.0	11.0	11.0
1 5/8"	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1 3/4"	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1 7/8"	14.0	14.0	14.0	14.0	14.0	14.0	14.0
2"	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2 1/8"	16.0	16.0	16.0	16.0	16.0	16.0	16.0
2 1/4"	17.0	17.0	17.0	17.0	17.0	17.0	17.0
2 3/8"	18.0	18.0	18.0	18.0	18.0	18.0	18.0
2 1/2"	19.0	19.0	19.0	19.0	19.0	19.0	19.0
2 5/8"	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2 3/4"	21.0	21.0	21.0	21.0	21.0	21.0	21.0
2 7/8"	22.0	22.0	22.0	22.0	22.0	22.0	22.0
3"	23.0	23.0	23.0	23.0	23.0	23.0	23.0
3 1/8"	24.0	24.0	24.0	24.0	24.0	24.0	24.0
3 1/4"	25.0	25.0	25.0	25.0	25.0	25.0	25.0
3 3/8"	26.0	26.0	26.0	26.0	26.0	26.0	26.0
3 1/2"	27.0	27.0	27.0	27.0	27.0	27.0	27.0
3 5/8"	28.0	28.0	28.0	28.0	28.0	28.0	28.0
3 3/4"	29.0	29.0	29.0	29.0	29.0	29.0	29.0
3 7/8"	30.0	30.0	30.0	30.0	30.0	30.0	30.0
4"	31.0	31.0	31.0	31.0	31.0	31.0	31.0
4 1/8"	32.0	32.0	32.0	32.0	32.0	32.0	32.0
4 1/4"	33.0	33.0	33.0	33.0	33.0	33.0	33.0
4 3/8"	34.0	34.0	34.0	34.0	34.0	34.0	34.0
4 1/2"	35.0	35.0	35.0	35.0	35.0	35.0	35.0
4 5/8"	36.0	36.0	36.0	36.0	36.0	36.0	36.0
4 3/4"	37.0	37.0	37.0	37.0	37.0	37.0	37.0
4 7/8"	38.0	38.0	38.0	38.0	38.0	38.0	38.0
5"	39.0	39.0	39.0	39.0	39.0	39.0	39.0
5 1/8"	40.0	40.0	40.0	40.0	40.0	40.0	40.0
5 1/4"	41.0	41.0	41.0	41.0	41.0	41.0	41.0
5 3/8"	42.0	42.0	42.0	42.0	42.0	42.0	42.0
5 1/2"	43.0	43.0	43.0	43.0	43.0	43.0	43.0
5 5/8"	44.0	44.0	44.0	44.0	44.0	44.0	44.0
5 3/4"	45.0	45.0	45.0	45.0	45.0	45.0	45.0
5 7/8"	46.0	46.0	46.0	46.0	46.0	46.0	46.0
6"	47.0	47.0	47.0	47.0	47.0	47.0	47.0
6 1/8"	48.0	48.0	48.0	48.0	48.0	48.0	48.0
6 1/4"	49.0	49.0	49.0	49.0	49.0	49.0	49.0
6 3/8"	50.0	50.0	50.0	50.0	50.0	50.0	50.0
6 1/2"	51.0	51.0	51.0	51.0	51.0	51.0	51.0
6 5/8"	52.0	52.0	52.0	52.0	52.0	52.0	52.0
6 3/4"	53.0	53.0	53.0	53.0	53.0	53.0	53.0
6 7/8"	54.0	54.0	54.0	54.0	54.0	54.0	54.0
7"	55.0	55.0	55.0	55.0	55.0	55.0	55.0
7 1/8"	56.0	56.0	56.0	56.0	56.0	56.0	56.0
7 1/4"	57.0	57.0	57.0	57.0	57.0	57.0	57.0
7 3/8"	58.0	58.0	58.0	58.0	58.0	58.0	58.0
7 1/2"	59.0	59.0	59.0	59.0	59.0	59.0	59.0
7 5/8"	60.0	60.0	60.0	60.0	60.0	60.0	60.0
7 3/4"	61.0	61.0	61.0	61.0	61.0	61.0	61.0
7 7/8"	62.0	62.0	62.0	62.0	62.0	62.0	62.0
8"	63.0	63.0	63.0	63.0	63.0	63.0	63.0
8 1/8"	64.0	64.0	64.0	64.0	64.0	64.0	64.0
8 1/4"	65.0	65.0	65.0	65.0	65.0	65.0	65.0
8 3/8"	66.0	66.0	66.0	66.0	66.0	66.0	66.0
8 1/2"	67.0	67.0	67.0	67.0	67.0	67.0	67.0
8 5/8"	68.0	68.0	68.0	68.0	68.0	68.0	68.0
8 3/4"	69.0	69.0	69.0	69.0	69.0	69.0	69.0
8 7/8"	70.0	70.0	70.0	70.0	70.0	70.0	70.0
9"	71.0	71.0	71.0	71.0	71.0	71.0	71.0
9 1/8"	72.0	72.0	72.0	72.0	72.0	72.0	72.0
9 1/4"	73.0	73.0	73.0	73.0	73.0	73.0	73.0
9 3/8"	74.0	74.0	74.0	74.0	74.0	74.0	74.0
9 1/2"	75.0	75.0	75.0	75.0	75.0	75.0	75.0
9 5/8"	76.0	76.0	76.0	76.0	76.0	76.0	76.0
9 3/4"	77.0	77.0	77.0	77.0	77.0	77.0	77.0
9 7/8"	78.0	78.0	78.0	78.0	78.0	78.0	78.0
10"	79.0	79.0	79.0	79.0	79.0	79.0	79.0
10 1/8"	80.0	80.0	80.0	80.0	80.0	80.0	80.0
10 1/4"	81.0	81.0	81.0	81.0	81.0	81.0	81.0
10 3/8"	82.0	82.0	82.0	82.0	82.0	82.0	82.0
10 1/2"	83.0	83.0	83.0	83.0	83.0	83.0	83.0
10 5/8"	84.0	84.0	84.0	84.0	84.0	84.0	84.0
10 3/4"	85.0	85.0	85.0	85.0	85.0	85.0	85.0
10 7/8"	86.0	86.0	86.0	86.0	86.0	86.0	86.0
11"	87.0	87.0	87.0	87.0	87.0	87.0	87.0
11 1/8"	88.0	88.0	88.0	88.0	88.0	88.0	88.0
11 1/4"	89.0	89.0	89.0	89.0	89.0	89.0	89.0
11 3/8"	90.0	90.0	90.0	90.0	90.0	90.0	90.0
11 1/2"	91.0	91.0	91.0	91.0	91.0	91.0	91.0
11 5/8"	92.0	92.0	92.0	92.0	92.0	92.0	92.0
11 3/4"	93.0	93.0	93.0	93.0	93.0	93.0	93.0
11 7/8"	94.0	94.0	94.0	94.0	94.0	94.0	94.0
12"	95.0	95.0	95.0	95.0	95.0	95.0	95.0
12 1/8"	96.0	96.0	96.0	96.0	96.0	96.0	96.0
12 1/4"	97.0	97.0	97.0	97.0	97.0	97.0	97.0
12 3/8"	98.0	98.0	98.0	98.0	98.0	98.0	98.0
12 1/2"	99.0	99.0	99.0	99.0	99.0	99.0	99.0
12 5/8"	100.0	100.0	100.0	100.0	100.0	100.0	100.0
12 3/4"	101.0	101.0	101.0	101.0	101.0	101.0	101.0
12 7/8"	102.0	102.0	102.0	102.0	102.0	102.0	102.0
13"	103.0	103.0	103.0	103.0	103.0	103.0	103.0
13 1/8"	104.0	104.0	104.0	104.0	104.0	104.0	104.0
13 1/4"	105.0	105.0	105.0	105.0	105.0	105.0	105.0
13 3/8"	106.0	106.0	106.0	106.0	106.0	106.0	106.0
13 1/2"	107.0	107.0	107.0	107.0	107.0	107.0	107.0
13 5/8"	108.0	108.0	108.0	108.0	108.0	108.0	108.0
13 3/4"	109.0	109.0	109.0	109.0	109.0	109.0	109.0
13 7/8"	110.0	110.0	110.0	110.0	110.0	110.0	110.0
14"	111.0	111.0	111.0	111.0	111.0	111.0	111.0
14 1/8"	112.0	112.0	112.0	112.0	112.0	112.0	112.0
14 1/4"	113.0	113.0	113.0	113.0	113.0	113.0	113.0
14 3/8"	114.0	114.0	114.0	114.0	114.0	114.0	114.0
14 1/2"	115.0	115.0	115.0	115.0	115.0	115.0	115.0
14 5/8"	116.0	116.0	116.0	116.0	116.0	116.0	116.0
14 3/4"	117.0	117.0	117.0	117.0	117.0	117.0	117.0
14 7/8"	118.0	118.0	118.0	118.0	118.0	118.0	118.0
15"	119.0	119.0	119.0	119.0	119.0	119.0	119.0
15 1/8"	120.0	120.0	120.0	120.0	120.0	120.0	120.0
15 1/4"	121.0	121.0	121.0	121.0	121.0	121.0	121.0
15 3/8"	122.0	122.0	122.0	122.0	122.0	122.0	122.0
15 1/2"	123.0	123.0	123.0	123.0	123.0	123.0	123.0
15 5/8"	124.0	124.0	124.0	124.0	124.0	124.0	124.0
15 3/4"	125.0	125.0	125.0	125.0	125.0	125.0	125.0
15 7/8"	126.0	126.0	126.0	126.0	126.0	126.0	126.0
16"	127.0	127.0	127.0	127.0	127.0	127.0	127.0
16 1/8"	128.0	128.0	128.0	128.0	128.0	128.0	128.0
16 1/4"	129.0	129.0	129.0	129.0	129.0	129.0	129.0
16 3/8"	130.0	130.0	130.0	130.0	130.0	130.0	130.0
16 1/2"	131.0	131.0	131.0	131.0	131.0	131.0	131.0
16 5/8"	132.0	132.0	132.0	132.0	132.0	132.0	132.0
16 3/4"	133.0	133.0	133.0	133.0	133.0	133.0	133.0
16 7/8"	134.0	134.0	134.0	134.0	134.0	134.0	134.0
17"	135.0	135.0	135.0	135.0	135.0	135.0	135.0
17 1/8"	136.0	136.0	136.0	136.0	136.0	136.0	136.0
17 1/4"	137.0	137.0	137.0	137.0	137.0	137.0	137.0
17 3/8"	138.0	138.0	138.0	138.0	138.0	138.0	138.0
17 1/2"	139.0	139.0	139.0	139.0	139.0	139.0	139.0
17 5/8"	140.0	140.0	140.0	140.0	140.0	140.0	140.0
17 3/4"	141.0	141.0	141.0	141.0	141.0	141.0	141.0
17 7/8"	142.0	142.0	142.0	142.0	142.0	142.0	142.0
18"	143.0	143.0	143.0	143.0	143.0	143.0	143.0
18 1/8"	144.0	144.0	144.0	144.0	144.0	144.0	144.0
18 1/4"	145.0	145.0	145.0	145.0	145.0	145.0	145.0
18 3/8"	146.0	146.0	146.0	146.0	146.0	146.0	146.0
18 1/2"	147.0	147.0	147.0	147.0	147.0	147.0	147.0
18 5/8"	148.0	148.0	148.0				

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The Leading Numbers for the Eastern States are

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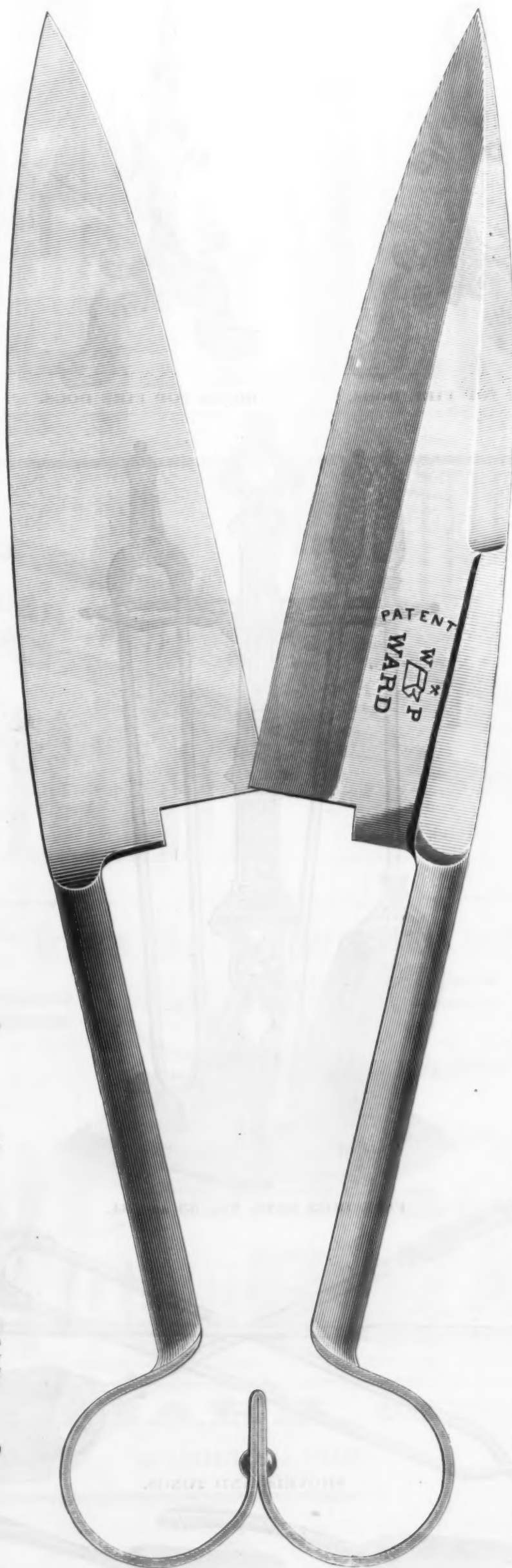
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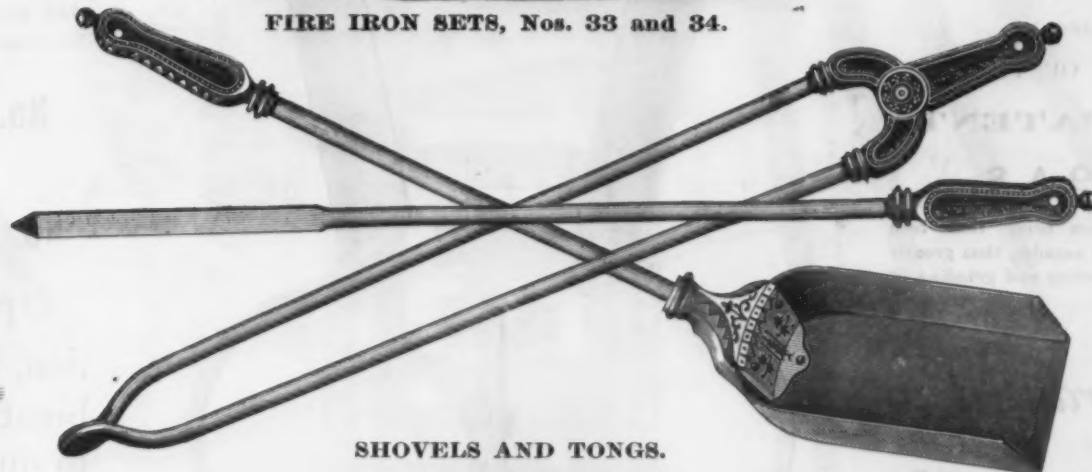
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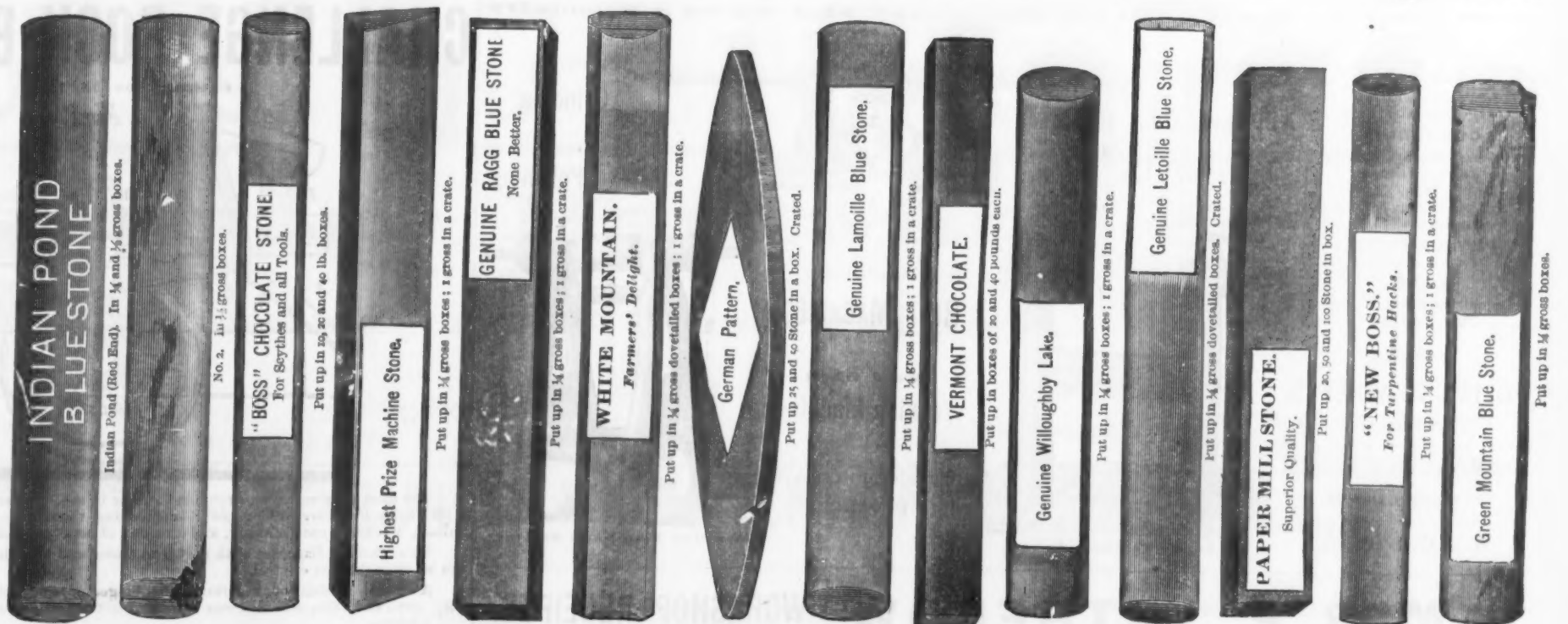
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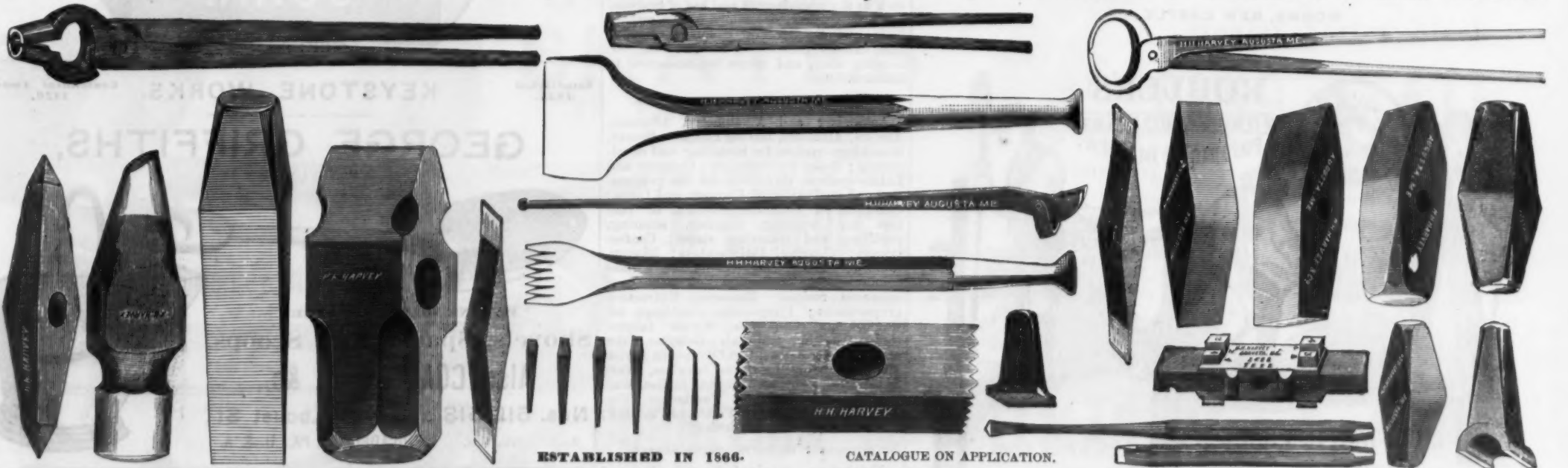
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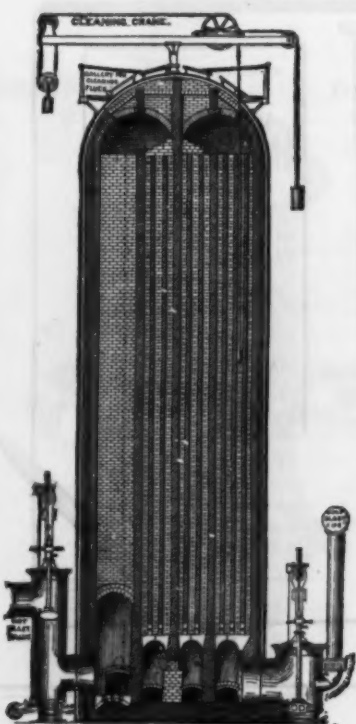
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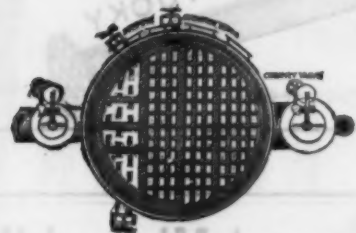
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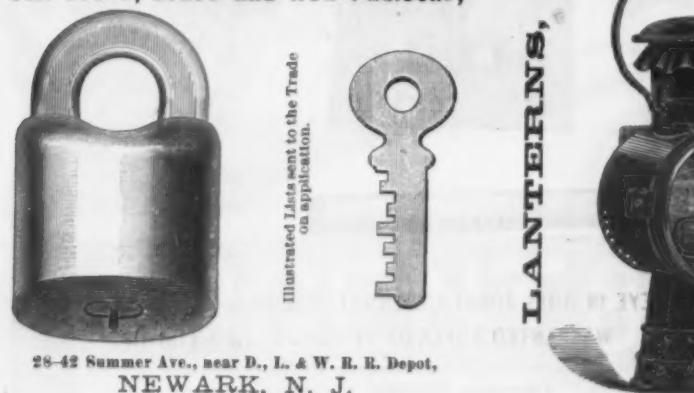
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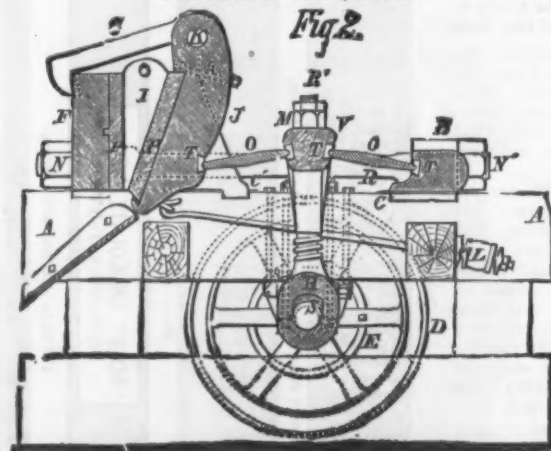
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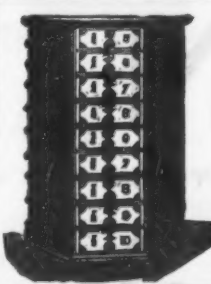
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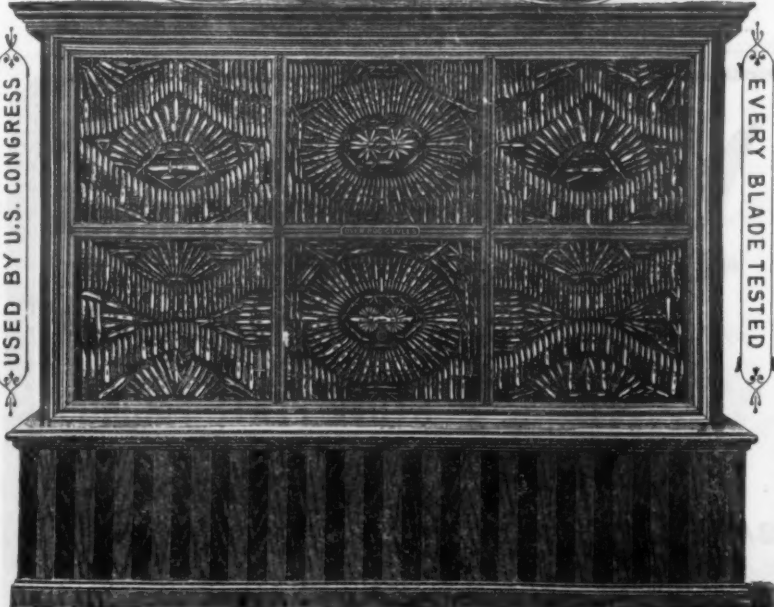
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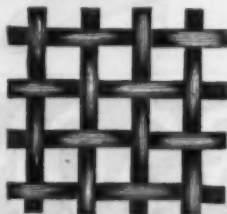
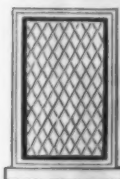
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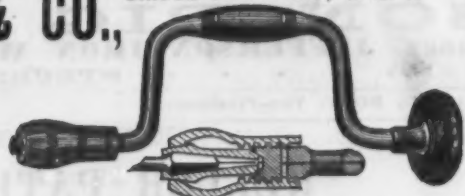
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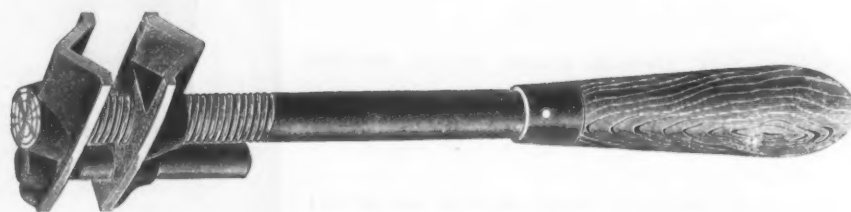
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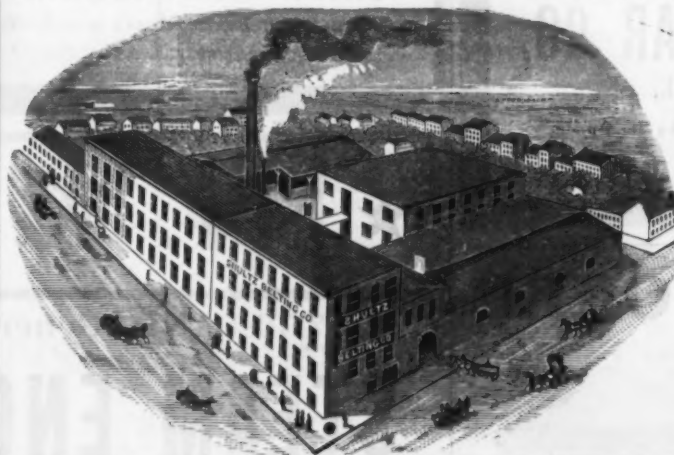
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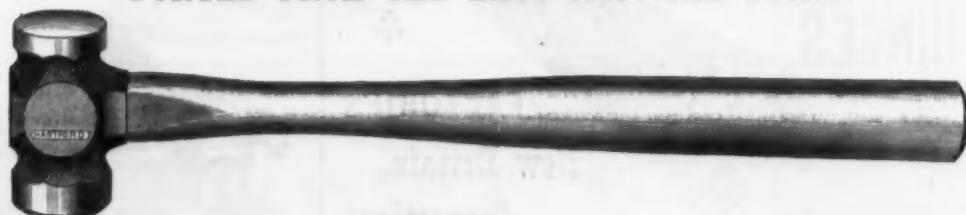
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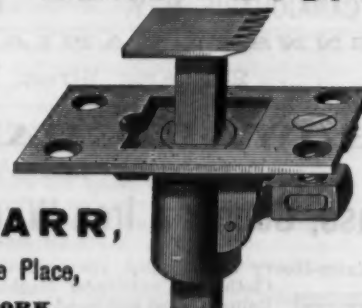
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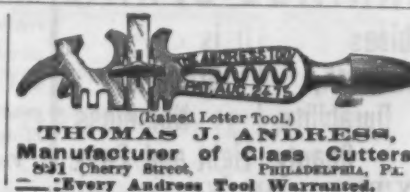
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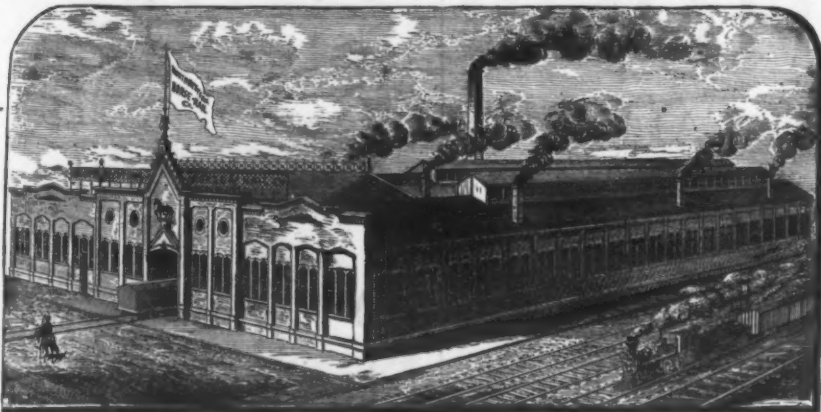
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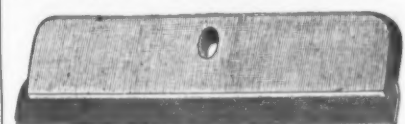
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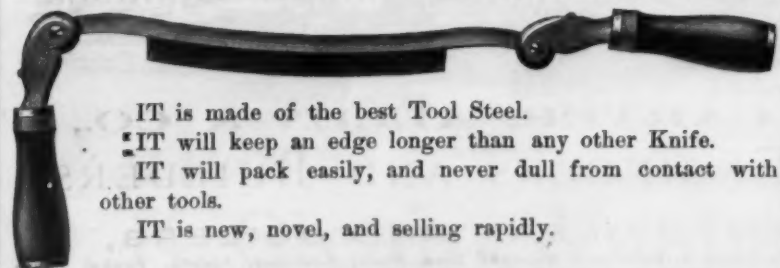
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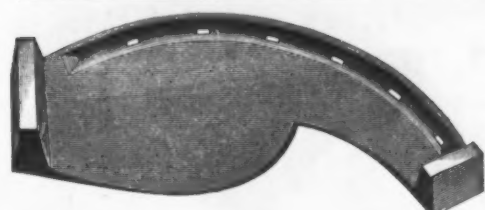


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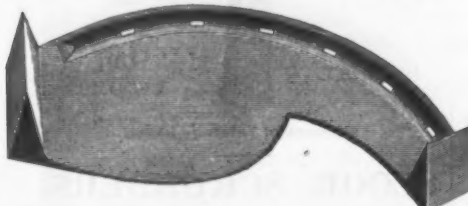
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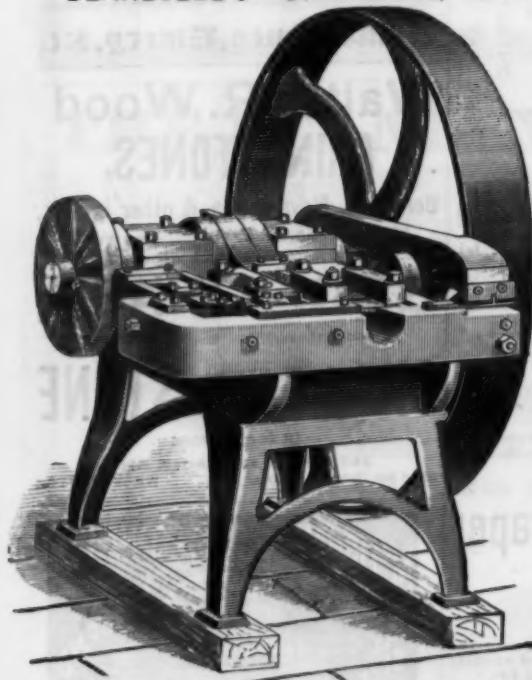
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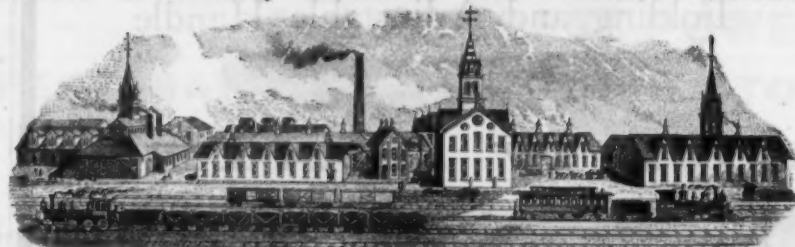
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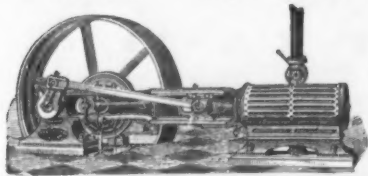


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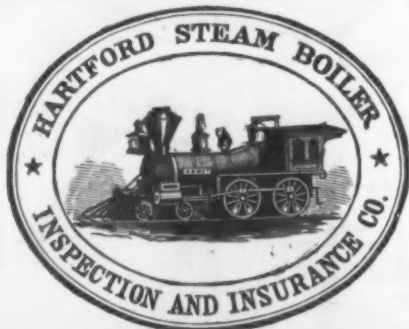


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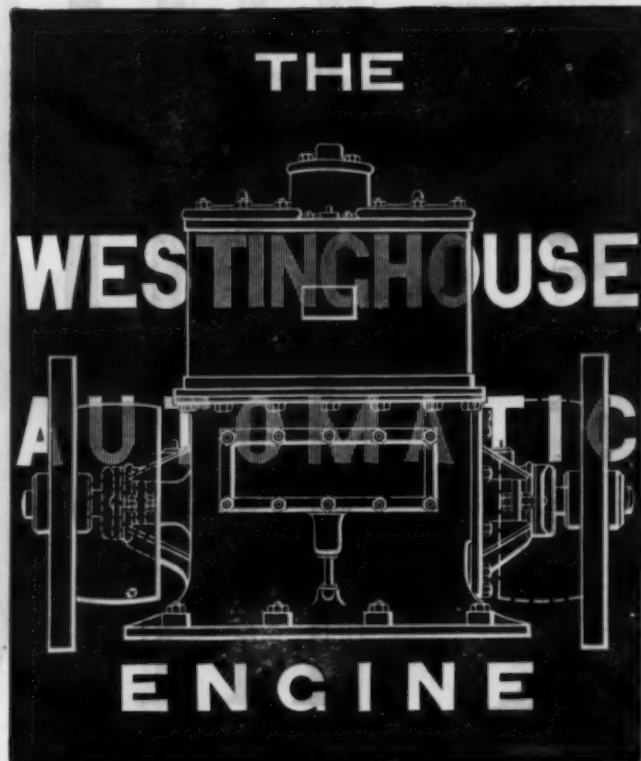
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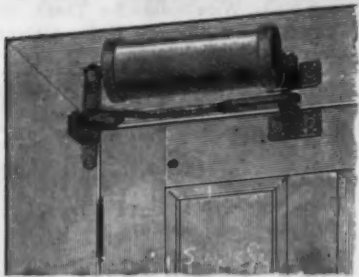


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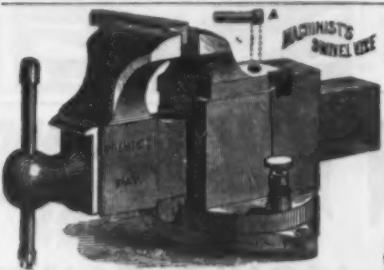
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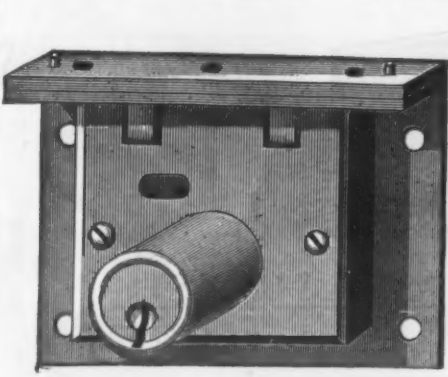


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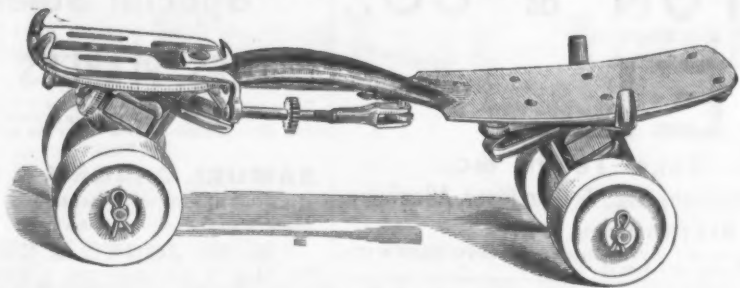
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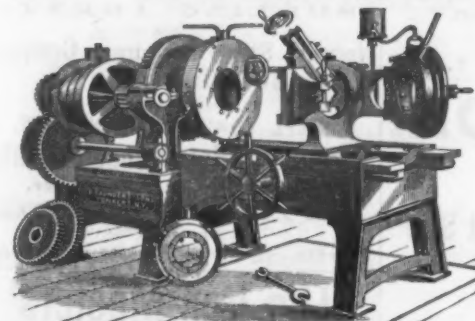


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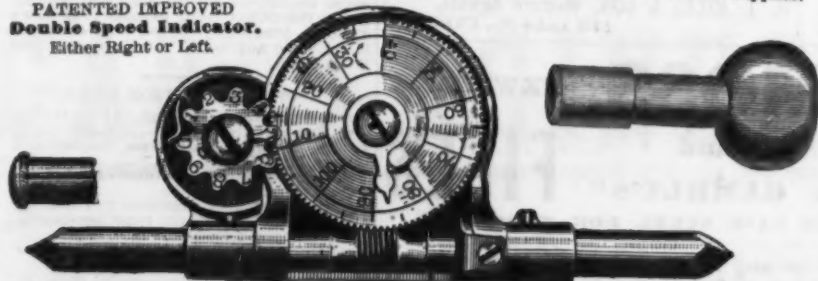
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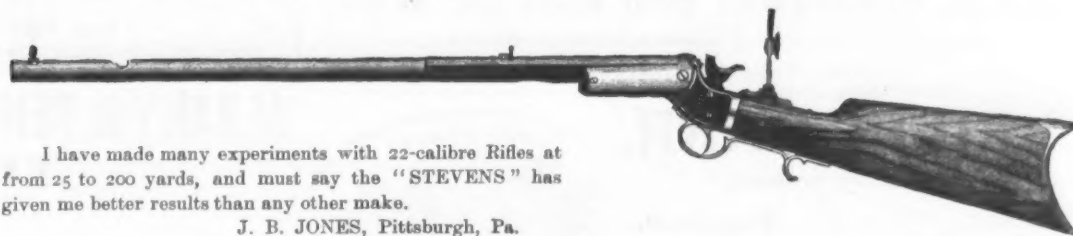


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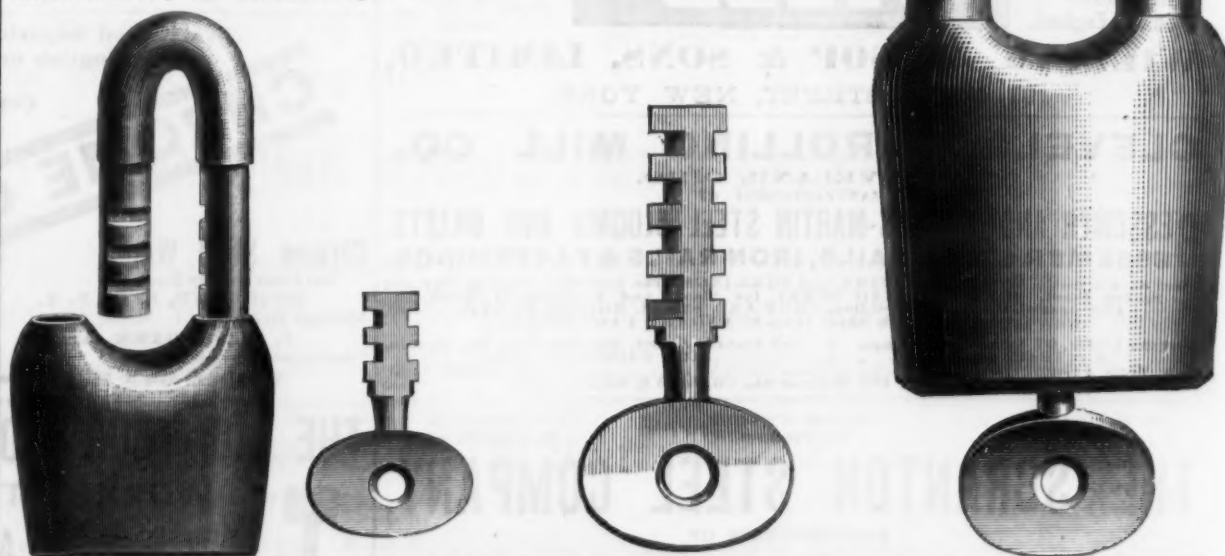
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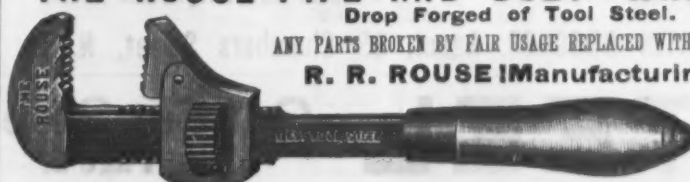
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LIST OF

TRADE MARKS, BRANDS, &c.

IN ORDER to meet a decided and constantly growing want, as made known and emphasized by almost daily inquiries asking for names and addresses of makers of iron, tools, tin plates, hardware, steel, machinery, oils, varnishes, japans, &c., &c., it has been decided to include in the

Ironmonger Diary and Text Book for 1885

(now in course of preparation) as complete a list as possible of trade-marks, brands, specialties, &c., made and in use in all parts of the world, similar to that contained in our Diary for 1884.

This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letterpress to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by 1½ inches wide, and the uniform charge is \$2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

The advertisements so inserted are printed on colored paper, classified under suitable heads, and so arranged as to make them both effective and useful.

Blocks or electros, &c., of marks or brands which may be too large are reduced by us at cost price (roughly about \$1 each) to the requisite size on receipt of remittance along with the cash for the cost of advertisement.

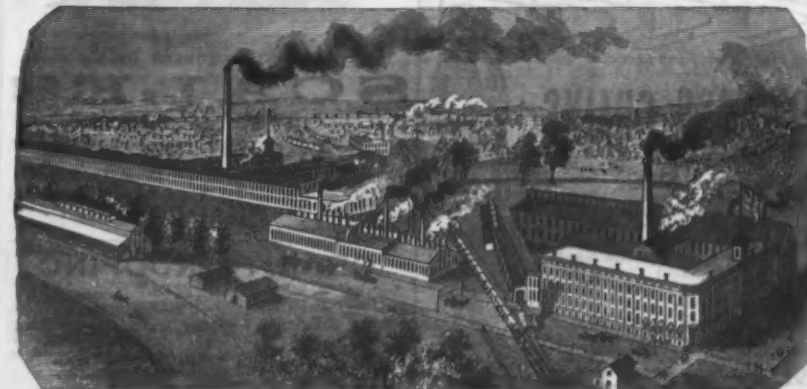
AMERICAN MANUFACTURERS AND EXPORTERS

of agricultural machinery and implements, "notions," general machinery, axes, hatchets and tools generally, nails, cutlery, electro-plated wares, clocks, safes, watches, oils, varnishes, japans, petroleum, paints, &c., &c., are strongly advised to take advantage of this excellent opportunity of placing their marks, &c., in a list which is constantly referred to all over the world, and especially (besides Great Britain) in Australia, New Zealand, India, Ceylon, South Africa, the West Indies and the British Colonies of North America.

Particulars, blocks or electros, and remittances, may be forwarded through any of the offices of the *Iron Age*, or direct to the publisher,

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will cut a key-way 12 in. long and 1¼ in. wide and perfectly straight; also 2½ x 2 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold chisel.
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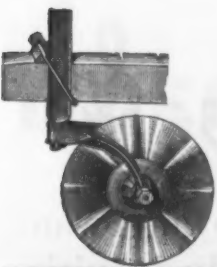
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NEW AUTOMATIC COMPENSATING
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Can easily be worked
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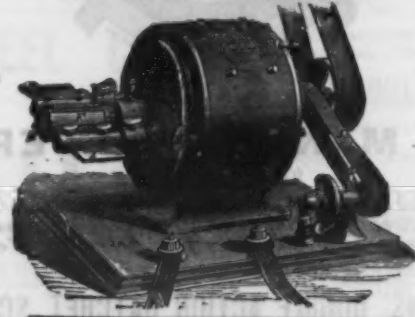
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 Peter Wright's, # 10, 100% @ 11¢
 Over 20¢ @ 11¢
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 Globe Apple Parer, \$5.50 net
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 Lots of 10 to 25 dozen, special prices.

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 Hunt & Kentucky and Yankee, # doz. net, \$7.25
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Augers and Auger Bits.—New List, January 7, 1884.

Bates' Nut Augers.—dis 60¢
 Cook's Augers, dis 55¢
 Watson's Ship Augers, dis 40¢
 Benjamin F. Auger Bit, dis 40¢
 New Haven Copper Company, dis 60¢
 Snell's Augers and Bits, dis 60¢
 Snell's Ship Augers, dis 10¢
 Cook's Auger Bits, dis 55¢
 Jennings' Auger Bits, new list, Jan. 1, 1884, dis 25¢
 Bonney's Pat. Augers, list \$48 # doz., dis 40¢
 Stearns' Pat. Augers, list \$48 # doz., dis 30¢
Balances.
 Light and Common, dis 40¢

Bells.
 Bevin Bros. Mfg. Co. Light Hand Bells, dis 75¢ to 75¢
 Swiss Pattern Hand Bells, dis 60¢
 Connell's Door Bells, dis 15¢ to 15¢
 Gt. Western & Kentucky Cow, new list, dis 70¢

Boring Machines.
 Upright, without Augers, list \$5.50, dis 50¢ to 50¢
 Angular, without Augers, list, 6.75
 Bells, Eastern Carriage Bells, new list, dis 75¢ to 75¢
 Philadelphia Carriage Bells, new list, dis 75¢ to 75¢
 Stanley, Wrought Auger, dis 50¢ to 50¢
Braces.—Barber's, dis 40¢ to 40¢
 Backus, dis 50¢ to 50¢
 Spofford, dis 50¢ to 50¢
 American Ball, dis 55¢
Butts.—Cast Fast Joint, Narrow, dis 40¢ to 40¢
 Cast Fast Joint, Broad, dis 40¢ to 40¢
 Cast Loose Joint, Narrow, dis 40¢ to 40¢
 Cast Loose Joint, Broad, dis 40¢ to 40¢
 Cast Acorn, Loose Pin, dis 40¢ to 40¢
 Cast Acorn, Japanned, dis 40¢ to 40¢
 Cast Mayer's Loose Joint, dis 40¢ to 40¢
 Wrought Loose Pin, dis 40¢ to 40¢
 Wrought Table Hinges and Back Flaps, dis 50¢ to 50¢
 Wrought Narrow Fast, dis 55¢ to 55¢
 Wrought Loose Joint, dis 40¢ to 40¢

Blind Butts.
 Parker, dis 70¢ to 70¢
 Clark, dis 75¢ to 75¢
 Shepherd, dis 75¢ to 75¢
 Lull & Porter, dis 80¢ to 80¢
 Butler's, dis 80¢ to 80¢
Casters.—New List, Jan. 1, 1884, dis 50¢ to 50¢
 Plate, dis 50¢ to 50¢
Chains.—German Halter and Coll, list June, 1884, dis 50¢ to 50¢
 Galvanized Pull Chain—English, dis 50¢ to 50¢
 Best Proof Pull Chain—English, dis 50¢ to 50¢
Chisels.—Socket Framing, dis 70¢ to 70¢
 Socket Firm, dis 70¢ to 70¢
 Butcher's, dis 80¢ to 80¢
Coffee Mills.—Box and Side new list Jan. 1, 1884, dis 50¢ to 50¢
 Enterprise, dis 50¢ to 50¢
Cutlery.—Walden Pocket, new list, dis 50¢ to 50¢
 Pennsylvania Knife Co., new list, dis 50¢ to 50¢
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 Eagle—3/4 in. roll, each, \$2.15, dis 25¢ to 25¢
 Eagle—5/8 in. roll, each, 3.50
 Crown—3/4 in. roll, each, 4.00, dis 35¢ to 35¢
 Crown—5/8 in. roll, each, 6.50
 Geneva Fluter, dis 25¢ to 25¢
 Favorite com. Fluter and Lead Iron, # doz., \$10.50 net

Hammers.
 Verkes & Plumb's, new list, dis 30¢ to 30¢
 Maydole Hammers, dis 15¢ to 15¢
 Howell A. E. Nail Hammers, # doz., net \$3.75

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 Weston Loop Handles Cross-Cut, dis 35¢ pair net
 Boynton Loop Handles Cross-Cut, dis 35¢ pair net
Hatchets.
 Verkes & Plumb, new list, dis 40¢ to 40¢
 Hunt, dis 35¢ to 35¢

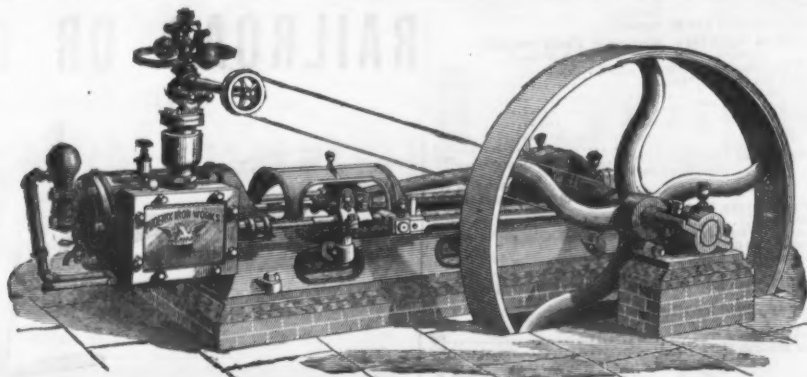
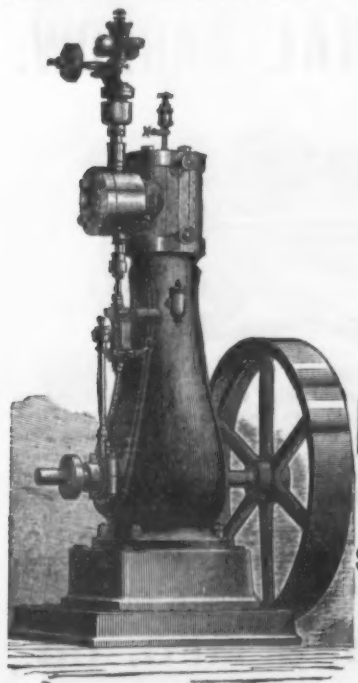
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 Hunt, dis 35¢ to 35¢

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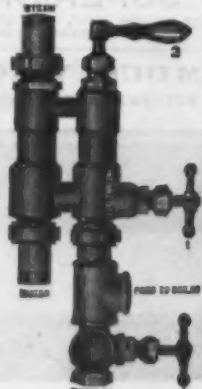
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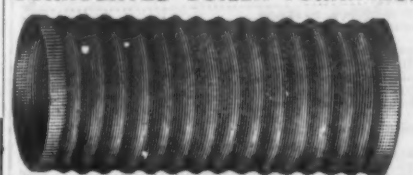
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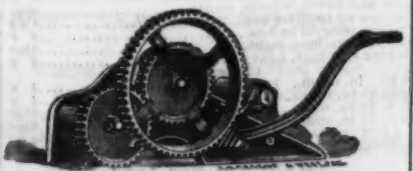
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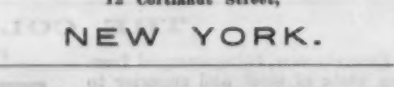
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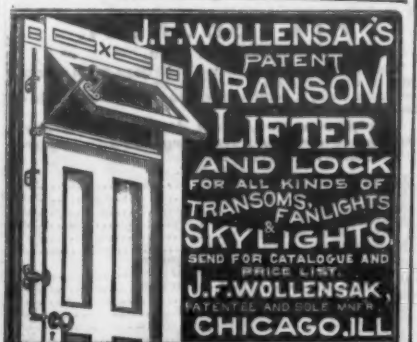
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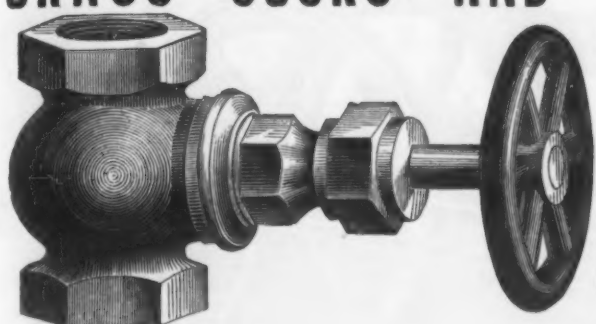
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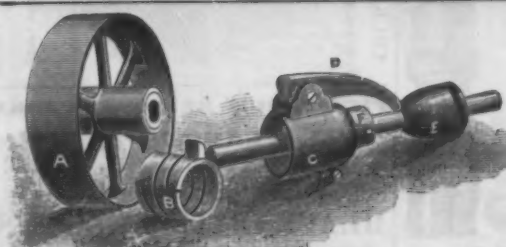
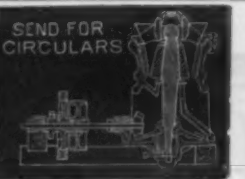
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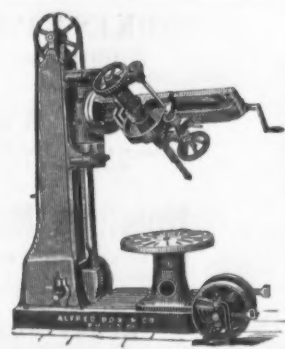
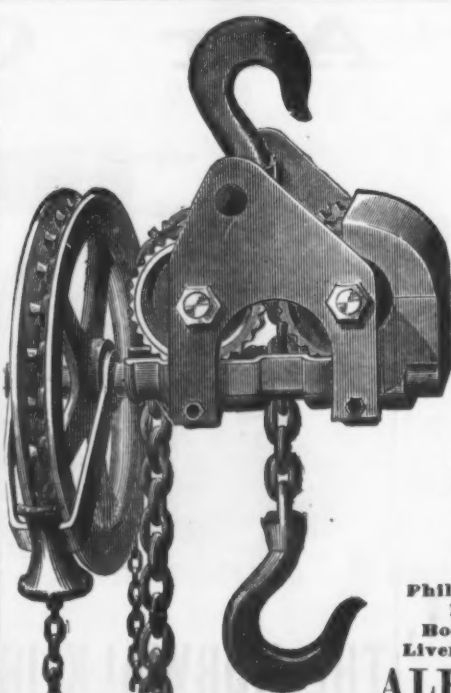
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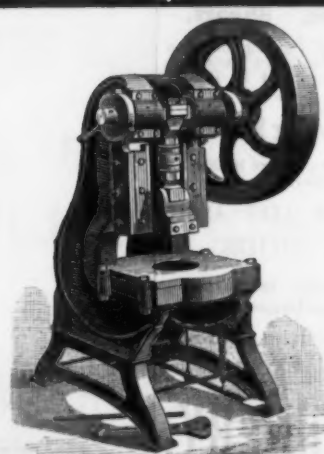
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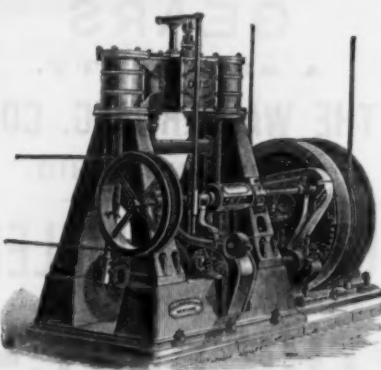
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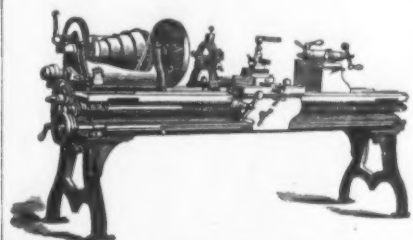
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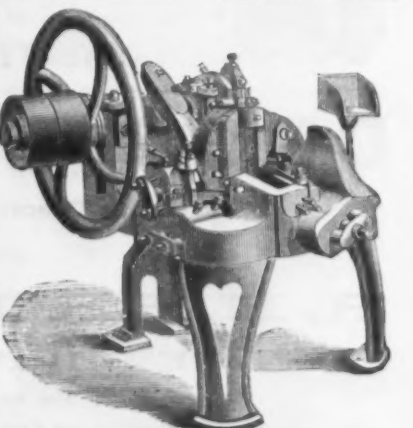
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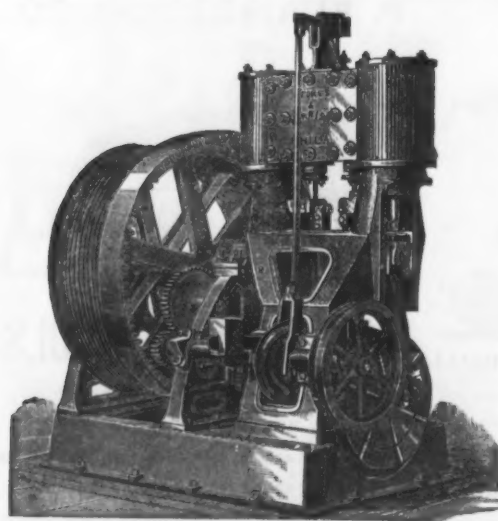
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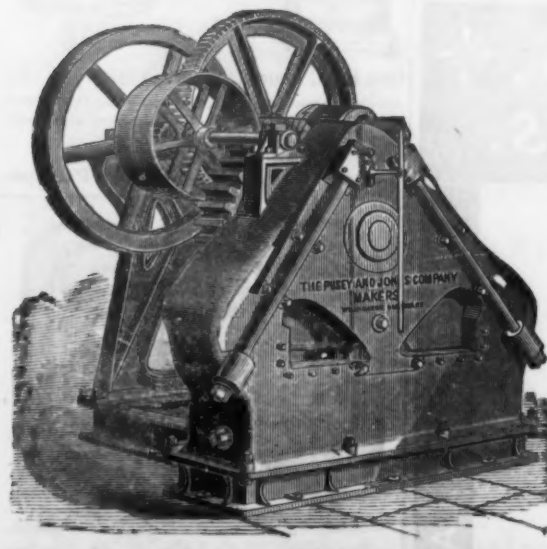
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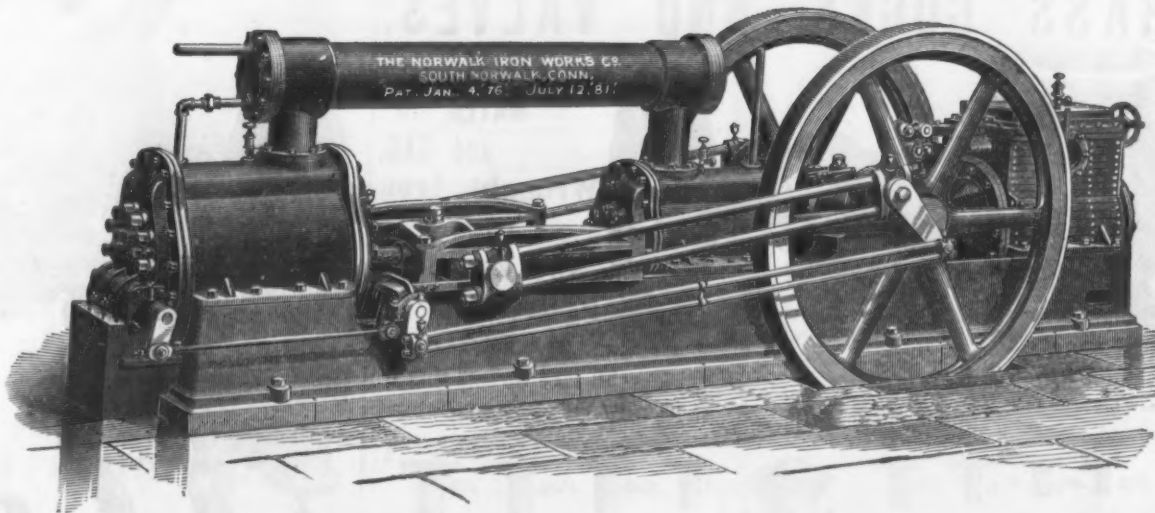
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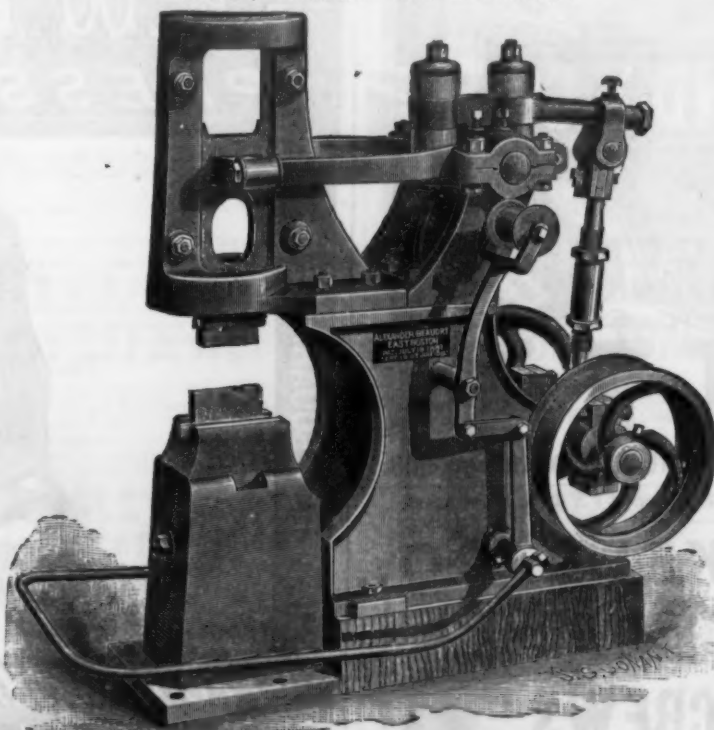
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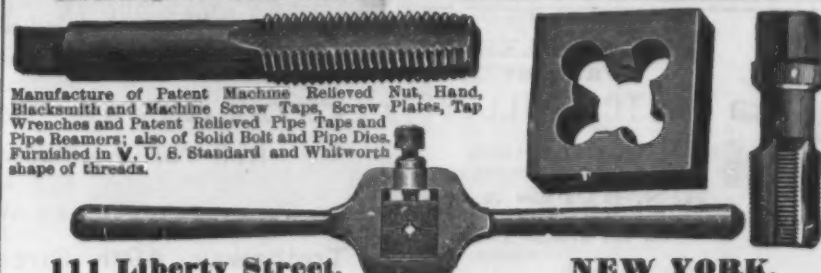
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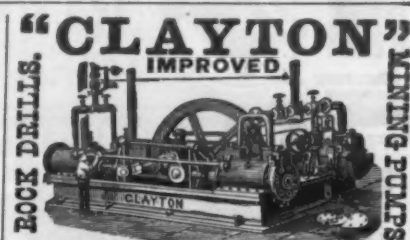
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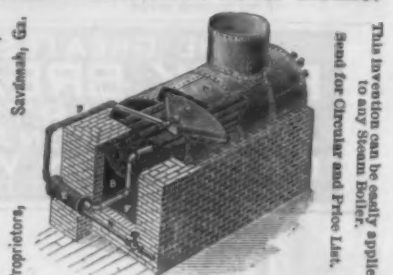


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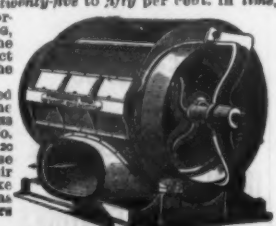
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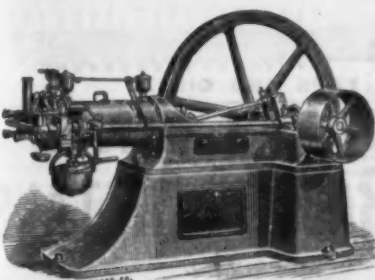
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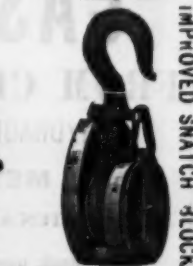
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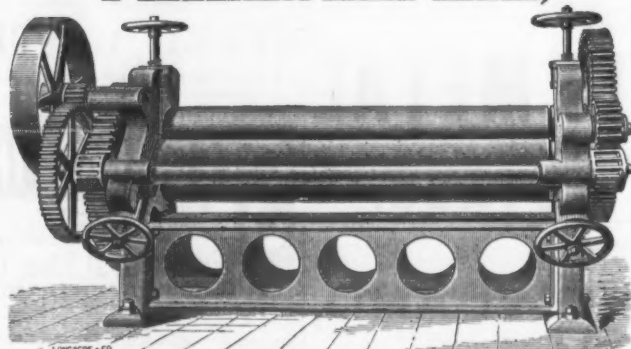
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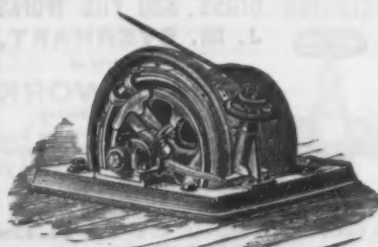


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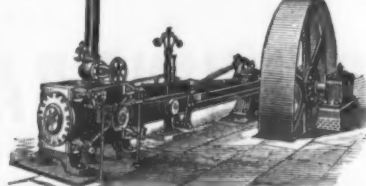
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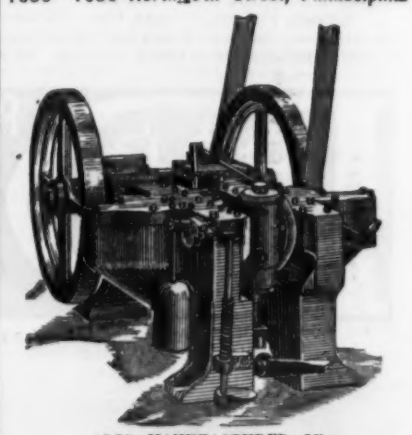
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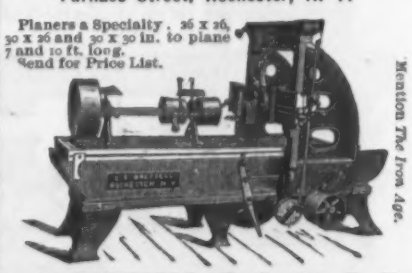
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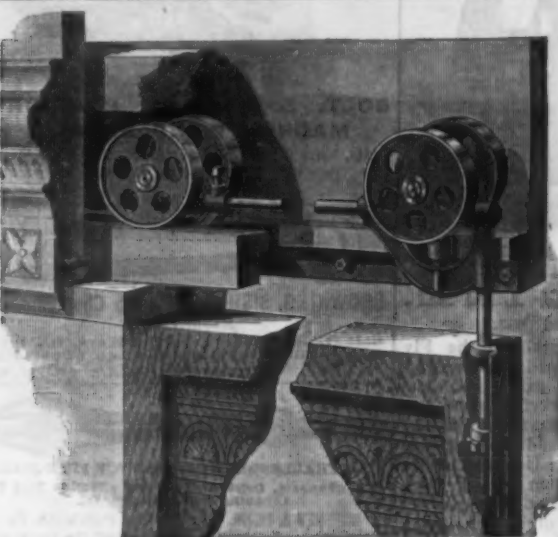
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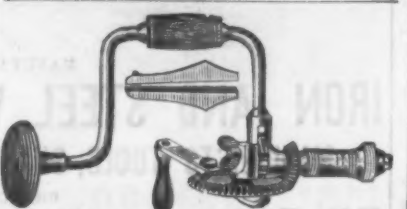
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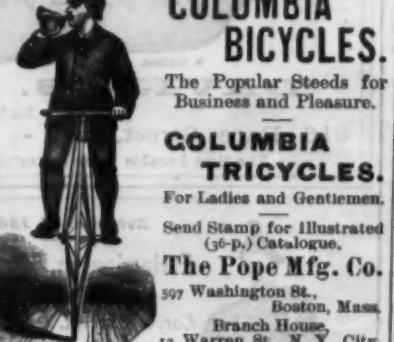
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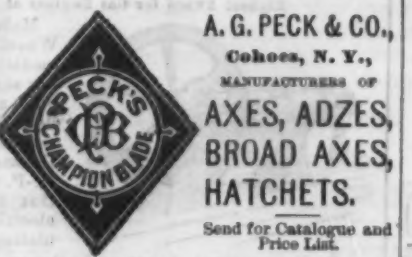
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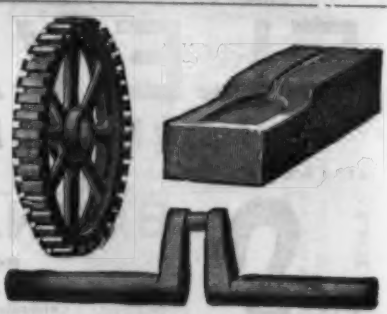
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